

substitution of DTV channel 42 for channel 62 at Hammond. DTV Channel 42 can be allotted to Hammond at reference coordinates 29–58–57 N. and 89–57–09 W. with a power of 1000, a height above average terrain HAAT of 308 meters.

**DATES:** Comments must be filed on or before July 29, 2002, and reply comments on or before August 13, 2002.

**ADDRESSES:** The Commission permits the electronic filing of all pleadings and comments in proceeding involving petitions for rule making (*except in broadcast allotment proceedings*). See *Electronic Filing of Documents in Rule Making Proceedings*, GC Docket No. 97–113 (rel. April 6, 1998). Filings by paper can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). The Commission's contractor, Vistrionix, Inc., will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, NE., Suite 110, Washington, DC 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners.

Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12th Street, SW., Washington, DC 20554. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission, Washington, DC 20554. In addition to filing comments with the FCC, interested parties should serve the petitioner, or its counsel or consultant, as follows: David D. Oxenford, Shaw Pittman, LLP, 2300 N Street, NW., Washington, DC 20037–1128 (Counsel for KB Prime Media LLC).

**FOR FURTHER INFORMATION CONTACT:** Pam Blumenthal, Media Bureau, (202) 418–1600.

**SUPPLEMENTARY INFORMATION:** This is a synopsis of the Commission's Notice of Proposed Rule Making, MB Docket No. 02–131, adopted May 29, 2002, and released June 5, 2002. The full text of this document is available for public inspection and copying during regular business hours in the FCC Reference Information Center, Portals II, 445 12th Street, SW., Room CY–A257, Washington, DC 20554. This document

may also be purchased from the Commission's duplicating contractor, Qualex International, Portals II, 445 12th Street, SW., Room CY–B402, Washington, DC, 20554, telephone 202–863–2893, facsimile 202–863–2898, or via e-mail [qualexint@aol.com](mailto:qualexint@aol.com).

Provisions of the Regulatory Flexibility Act of 1980 do not apply to this proceeding.

Members of the public should note that from the time a Notice of Proposed Rule Making is issued until the matter is no longer subject to Commission consideration or court review, all *ex parte* contacts are prohibited in Commission proceedings, such as this one, which involve channel allotments. See 47 CFR 1.1204(b) for rules governing permissible *ex parte* contacts.

For information regarding proper filing procedures for comments, see 47 CFR 1.415 and 1.420.

#### List of Subjects in 47 CFR Part 73

Digital television broadcasting, Television.

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR part 73 as follows:

#### PART 73—RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

**Authority:** 47 U.S.C. 154, 303, 334 and 336.

##### § 73.606 [Amended]

2. Section 73.606(b), the Table of Television Allotments under Louisiana is amended by removing Hammond, channel 62+.

##### § 73.622 [Amended]

3. Section 73.622(b), the Table of Digital Television Allotments under Louisiana is amended by adding Hammond, DTV channel 42.

Federal Communications Commission.

**Barbara A. Kreisman,**

Chief, Video Division, Media Bureau.

[FR Doc. 02–14998 Filed 6–12–02; 8:45 am]

**BILLING CODE 6712–01–P**

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

RIN 1018–AH94

#### Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Blackburn's Sphinx Moth

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Proposed rule.

**SUMMARY:** We, the U. S. Fish and Wildlife Service (Service), propose designation of critical habitat for the Blackburn's sphinx moth (*Manduca blackburni*), pursuant to the Endangered Species Act of 1973, as amended (Act). A total of approximately 40,240 hectares (99,433 acres) on the Hawaiian Islands of Maui, Hawaii, Molokai, and Kahoolawe are proposed for designation as critical habitat for Blackburn's sphinx moth.

Critical habitat receives protection from destruction or adverse modification through required consultation under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency. Section 4 of the Act requires us to consider economic and other relevant impacts when specifying any particular area as critical habitat.

We solicit data and comments from the public on all aspects of this proposal, including data on economic and other impacts of the designation. We may revise or further refine critical habitat boundaries described in this proposal after taking into consideration the comments or any new information received during the comment period, and such information may lead to a final regulation that differs from this proposal.

**DATES:** We will accept comments until the close of business on August 12, 2002. Requests for a public hearing must be received by July 29, 2002.

**ADDRESSES:** If you wish to comment, send your comments and other materials on this proposed rule to Paul Henson, Field Supervisor, Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3–122, Box 50088, Honolulu, HI 96850. You may also hand-deliver written comments to our Pacific Islands Fish and Wildlife Office at the address given above. You may view the comments and materials that we receive, as well as supporting documentation used in the preparation of this proposed rule, by appointment,

during normal business hours at our Pacific Islands Fish and Wildlife Office.

**FOR FURTHER INFORMATION CONTACT:** Paul Henson, Field Supervisor, Pacific Islands Fish and Wildlife Office, at the above address (telephone 808/541-3441; facsimile 808/541-3470).

**SUPPLEMENTARY INFORMATION:**

**Species Description**

Blackburn's sphinx moth (moth) (*Manduca blackburni*) is one of Hawaii's largest native insects, with a wingspan of up to 12 centimeters (cm) (5 inches (in)). Like other sphinx moths in the family Sphingidae, it has long, narrow forewings, and a thick, spindle-shaped body tapered at both ends. It is grayish brown in color, with black bands across the apical (top) margins of the hind wings, and five orange spots along each side of the abdomen. The larva is a typical, large "hornworm" caterpillar, with a spine-like process on the dorsal (upper) surface of the eighth abdominal segment. Caterpillars occur in two color forms, a bright green or a grayish form. This variation in color does not appear until the fifth instar (the fifth stage between molts) (Van Gelder and Conant 1998). Both color forms have scattered white speckles throughout the dorsum (back), with the lateral (side) margin of each segment bearing a horizontal white stripe, and segments four to seven bearing diagonal stripes on the lateral margins (Betsy Gagné, Hawaii Department of Land and Natural Resources, pers. comm. 1998; Zimmerman 1958).

The moth is closely related to the tomato hornworm (*Manduca quinquemaculata*) and has been confused with this species. The moth was described by Butler (1880) as *Protoparce blackburni*, and named in honor of the Reverend Thomas Blackburn who collected the first specimens. It was later believed to be the same species as the tomato hornworm (*Sphinx celeus* Hubner = *Sphinx quinquemaculatus* Hawthorn) by Meyrick (1899), and then treated as a subspecies (Rothschild and Jordan 1903, as cited by Riotte 1986) and placed in the genus *Phlegethontius* (Zimmerman 1958). Riotte (1986) demonstrated Blackburn's sphinx moth is a distinct taxon in the genus *Manduca*, native to the Hawaiian Islands, and reinstated it as a full species, *Manduca blackburni*.

**Bio-Geographical Overview**

The Hawaiian archipelago includes large volcanic islands as well as the numerous shoals and atolls of the northwestern Hawaiian Islands. The

islands were formed sequentially by basaltic lava that emerged from a hot spot in the earth's crust located near the current southeastern coast of the island of Hawaii (Stearns 1985). It is widely accepted that the native flora and fauna of the Hawaiian Islands arrived by wind and ocean currents, as passengers on or inside other organisms, or as in the case of some fauna, on their own power, to evolve over the course of millions of years into one of most highly speciated and diverse natural environments found anywhere in the world (Wagner and Funk 1995). Below, we provide brief geographical descriptions of the Hawaiian Islands discussed in this proposed rule.

**Hawaii**

The island of Hawaii is the largest, highest, and youngest of the eight major islands, and it has an area of 10,458 square kilometers (km<sup>2</sup>) (4,038 square miles (mi<sup>2</sup>)). It was formed by five, interconnected shield volcanoes (Hualalai, Mauna Kea, Mauna Loa, Kilauea, and Kohala Mountains). The Kohala Mountains, at the northeastern portion of the island, are the oldest and reach an elevation of about 1,344 m (4,408 ft) above sea level. Mauna Kea volcano rises to 4,204 m (13,792 ft) (Department of Geography 1998) and is inter-connected with Mauna Loa by an extensive saddle. Hualalai volcano, located on the western side of the island, rises to an elevation of 2,520 m (8,269 ft). The two active volcanoes on the island, Mauna Loa and Kilauea, have elevations of 4,168 m (13,674 ft) and 1,247 m (4,093 ft), respectively.

Hawaii lies within the trade wind belt (Mueller-Dombois *et al.* 1985), and moisture derived from the Pacific Ocean is carried to the island by north-easterly trade winds. Heavy rains fall when moist air is driven upward by windward mountain slopes (Wagner *et al.* 1999). Considerable moisture reaches the lower leeward slopes of the saddle, but these slopes dry out rapidly as elevation increases. Thus, the leeward and saddle areas of Mauna Kea and Mauna Loa tend to be dry.

**Maui**

Maui, the second largest island in Hawaii at 1,888 km<sup>2</sup> (729 mi<sup>2</sup>) area, was formed by the eruptions of two large shield volcanoes, the older West Maui volcano on the west side, and the larger, but much younger, Haleakala volcano to the east. Stream erosion has cut deep valleys and ridges into the originally shield-shaped West Maui volcano. The highest point on West Maui is Puu Kukui at 1,764 m (5,788 ft) elevation, which has an average rainfall of 1,020

cm (400 in) per year, making it the second wettest spot in Hawaii (Department of Geography 1998). East Maui's Haleakala Mountain, reaching 3,055 m (10,023 ft) in elevation, has retained its classic shield shape with the most recent eruptions occurring in the last 220 years on the southeastern slopes. Rainfall on the slopes of Haleakala is extremely variable, with its windward (northeastern) slope receiving the most precipitation.

Geologically, Maui is part of the four-island complex comprising Maui, Molokai, Lanai, and Kahoolawe, known collectively as Maui Nui. During the last Ice Age about 12,000 years ago when sea levels were about 160 m (525 ft) below their present level, it is possible the four islands were connected by a broad lowland plain (Department of Geography 1998). This land bridge may have allowed the movement and interaction of the islands' flora and fauna and contributed to the close relationships of their biota of present (Hobdy 1993).

**Kahoolawe**

The island of Kahoolawe comprises some 117 km<sup>2</sup> (45 mi<sup>2</sup>). Located in the lee of Haleakala, the island lies approximately 11 kilometers (km) (6.7 miles (mi)) from East Maui. The highest point is the rim of an extinct volcano at 450 m (1,477 ft) above sea level (Department of Geography 1998). The estimated annual precipitation is approximately 50 cm (20 in), with most of it falling from November through March. In addition to the low precipitation, Kahoolawe has the highest mean wind velocity of the Hawaiian Islands (Department of Geography 1998).

Cattle from an early cattle industry and feral goats (*Capra hircus*) largely denuded the island beginning in the 1800s. Kahoolawe was later utilized as a military bombing target from 1941 through the 1980s. Current restoration work and erosion control have been hampered by an ongoing program to safely locate and dispose of unexploded ordnance on the island.

**Molokai**

The island of Molokai, the fifth largest in the Hawaiian Islands chain, encompasses an area of about 689 km<sup>2</sup> (266 mi<sup>2</sup>) (Department of Geography 1998). Three shield volcanoes make up most of the land mass of Molokai: West Molokai Mountain, East Molokai Mountain, and a volcano which formed Kalaupapa Peninsula (Department of Geography 1998).

The East Molokai Mountains rise 1,515 m (4,970 ft) above sea level and comprises roughly 50 percent of the island's area (Department of Geography 1998). Topographically, the windward side of East Molokai differs from the leeward side. Precipitous cliffs line the northern windward coast and deep inaccessible valleys dissect the coastal area. The annual rainfall on the windward side ranges from 190 to 380 cm (75 to 150 in) or more, distributed throughout the year. The soils are poorly drained and high in organic matter. Much of the native vegetation on the northern part of East Molokai is intact because of its relative inaccessibility to humans and nonnative animals, although feral ungulates have begun to access some of these areas in recent years (Department of Geography 1998).

#### **Blackburn's Sphinx Moth Biology and Status**

Very few specimens of the moth have been seen since 1940, and after a concerted effort by staff at the Bishop Museum to relocate this species in the late 1970s, it was considered to be extinct (Gagné and Howarth 1985). In 1984, a single population was rediscovered on Maui (Riotte 1986), and subsequently, populations on two other islands were rediscovered. Currently it is known only from populations on Maui, Kahoolawe, and Hawaii. Moth population numbers are known to be small based upon past sampling results, however, no reasonably accurate estimate of population sizes have been determinable at this point due to the adult moths' wide-ranging behavior and its overall rarity (A. Medeiros, U.S. Geological Survey-Biological Resource Division, pers. comm. 1998; Van Gelder and Conant 1998). Before humans arrived, dry and mesic shrubland and forest covered about 823,283 hectares (2,034,369 acres) on all the main islands (Hawaii Natural Heritage Program (HHP) 2000), and it is likely the moth inhabited much of that area (Riotte 1986). Reports by early naturalists indicate the species was once widespread and abundant, at least during European settlement on nearly all the main Hawaiian islands (Riotte 1986).

The moth has been recorded from the islands of Kauai, Kahoolawe, Oahu, Molokai, Maui, and Hawaii, and has been observed from sea level to 1,525 m (5,000 ft) elevation. Most historical records were from coastal or lowland dry forest habitats in areas receiving less than 127 cm (50 in) annual rainfall. On the island of Kauai, the moth was recorded only from the coastal area of

Nawiliwili. Populations were known from Honolulu, Honouliuli, and Makua on leeward Oahu, and Kamalo, Mapulehu, and Keopu on Molokai. On Hawaii, it was known from Hilo, Pahala, Kalaoa, Kona, and Hamakua. It appears this moth was historically most common on Maui, where it was recorded from Kahului, Spreckelsville, Makena, Wailuku, Kula, Lahaina, and West Maui.

Larvae of the moth feed on plants in the nightshade family (Solanaceae). The natural host plants are native trees within the genus *Nothocestrum* (aiea) (Riotte 1986), on which the larvae consume leaves, stems, flowers, and buds (B. Gagné, pers. comm. 1994). However, many of the host plants recorded for this species are not native to the Hawaiian Islands, and include *Nicotiana tabacum* (commercial tobacco), *Nicotiana glauca* (tree tobacco), *Solanum melongena* (eggplant), *Lycopersicon esculentum* (tomato), and possibly *Datura stramonium* (Jimson weed) (Riotte 1986). Sphingid moths are known to exploit nutritious but low-density, low-apparency host plants such as vines and sapling trees (Kitching and Cadiou 2000). Development from egg to adult can take as little as 56 days (Williams 1947), but pupae may remain in a state of torpor (inactivity) in the soil for up to a year (B. Gagné, pers. comm., 1994; Williams 1931). Adult moths have been found throughout the year (Riotte 1986). Adult moths feed on nectar, including that from *Ipomoea indica* (D. Hopper, *in litt.*, 2000, 2002). During Van Gelder and Conant's captive-rearing study (1998), adult moth feeding was not observed and captive-reared adult moths lived no longer than 12 days. In general, sphingids are known to live longer than most moths because of their ability to feed and take in water from a variety of sources, rather than relying only upon stored fat reserves. Because they live longer than most moths, female sphingid moths have less time pressure to mate and lay eggs, and often will take more time in locating the best host plants for egg laying (Kitching and Cadiou 2000).

#### **Blackburn's Sphinx Moth Habitat and Range**

Plant species composition in the moth's habitat varies considerably depending on location and elevation, but some of the most common native plants in areas where the moth occur are *Diospyros sandwicensis* trees, *Rauvolfia sandwicensis* trees, *Reynoldsia sandwicensis* trees, *Pouteria sandwicensis* trees, *Dodonaea viscosa* shrubs, *Erythrina sandwicensis*, and

*Myoporum sandwicense* shrubs (Cabin *et al.* 2000; Roderick and Gillespie 1997; Van Gelder and Conant 1998; Wagner *et al.* 1999; Wood 2001a, b).

The largest populations of Blackburn's sphinx moths, on Maui and Hawaii, are associated with trees in the genus *Nothocestrum* (Van Gelder and Conant 1998). For example, the large stand of *Nothocestrum* trees within the Kanaio Natural Area Reserve (NAR), Maui, is likely the largest in the State (Medeiros *et al.* 1993), and may explain why the moth occurs with such regularity in the Kanaio area (A. Medeiros, pers. comm., 1994). *Nothocestrum* is a genus of four species endemic to the Hawaiian Islands (Symon 1999). *Nothocestrum* species currently occur on Kauai, Oahu, Molokai, Lanai, Hawaii, and Maui. One species, *N. longifolium* primarily occurs in wet forests, but can occur in mesic forests as well. Three species, *N. latifolium*, *N. breviflorum*, and *N. peltatum*, occur in dry to mesic forests, the habitat in which the moth has been most frequently recorded. Moth larvae have been documented feeding on two *Nothocestrum* species, *N. latifolium* and *N. breviflorum*; it is likely that *N. peltatum* and *N. longifolium* are suitable host plants for larval moths as well. This is supported not only by the fact that they are closely related to known larval hosts, but also because there are past historical records of the moth occurring on the islands of Kauai and Oahu, where *N. latifolium* is not abundant and *N. breviflorum* does not occur. Furthermore, the species is known to feed on a variety of native and non-native Solanaceae.

On Molokai, moth habitat includes vegetation consisting primarily of mixed-species, mesic and dry forest communities composed of native and introduced plants (HHP 2000). Although Molokai is not known to currently contain a moth population, past moth sightings on Molokai have been reported and the island does contain native *Nothocestrum* larval host plants, including *N. longifolium* and *N. latifolium*, as well as adult host plants and restorable, manageable areas associated with these existing host plants (Wood 2001a). Because of its proximity to Maui (historically, home to the most persistent and largest population) and the fact that Molokai has in the past and presently supports large stands of *N. latifolium*, many researchers believe the moth could re-establish itself on the island and become a viable population(s) in the future (F. Howarth, Bishop Museum, pers. comm. 2001).

The endangered larval host plant, *Nothoecstrum breviflorum*, as well as adult host plants occur in the areas on Hawaii Island supporting populations of the moth (M. Brueggemann, Service, pers. comm., 1998) and there are many recorded associations of eggs, larvae, and adult moths with this plant species. This tree species is primarily threatened by habitat conversion associated with development; competition from nonnative species such as *Schinus terebinthifolius* (Christmas berry), *Pennisetum setaceum* (fountain grass), *Lantana camara* (lantana), and *Leucaena leucocephala* (koa haole); browsing by cattle; fire; random environmental events such as prolonged drought; and reduced reproductive potential due to the small number of existing individuals (59 FR 10325).

Although *Nothoecstrum* species are not currently reported from Kahoolawe, there were very few surveys of this island prior to the intense ranching activities, which began in the middle of the last century, and the subsequent use of the island as a weapons range for 50 years. Prior to their removal, goats also played a major role in the destruction of vegetation on Kahoolawe (Cuddihy and Stone 1990). It is likely the reappearance of some vegetation as a result of the removal of the goats and the cessation of military bombing activities has allowed the moth to inhabit the island. On Kahoolawe, moth larvae feed on the nonnative *Nicotiana glauca*, which appears to adequately support production and growth of the larval stage during non-drought years. However, the native *Nothoecstrum* are more stable and drought-resistant than the *Nicotiana glauca*, which dies back significantly during especially dry years (A. Medeiros, pers. comm., 2001). Therefore, it appears likely that long-term survival of the moth on Kahoolawe will require the planting of *Nothoecstrum latifolium* (A. Medeiros, pers. comm., 1998).

#### Threats to the Conservation of Blackburn's Sphinx Moth

##### Habitat Loss and Degradation

Dry to mesic forest habitats in Hawaii have been severely degraded due to past and present land management practices including ranching, the impacts of introduced plants and animals, wildfire, and agricultural development (Cuddihy and Stone 1990). Due to these factors, *Nothoecstrum peltatum* on Kauai and *N. breviflorum* on Hawaii are now federally listed as endangered species (59 FR 9327; 59 FR 10325). Although all *Nothoecstrum* species are not presently listed as endangered or threatened, the

entire genus is declining and considered uncommon (HHP 2000; Medeiros *et al.* 1993). For example, while *N. latifolium* presently occurs at moderate densities at Kanaio NAR (HHP 1993), there has been a complete lack of seedling survival (Medeiros *et al.* 1993) and the stand is being degraded by goats (Medeiros *et al.* 1993; F.G. Howarth, Bishop Museum, pers. comm., 1994; S. Montgomery, Bishop Museum, pers. comm., 1994). Goats have played a major role in the destruction of dryland and mesic forests throughout the Hawaiian Islands (Stone 1985; van Riper and van Riper 1982).

Before humans arrived, dry to mesic shrub land and forest covered about 823,283 ha (2,034,369 ac) on all the main islands (HHP 2000), and it is likely Blackburn's sphinx moth inhabited much of that area (Riotte 1986). Reports by early naturalists indicate the species was once widespread and abundant on nearly all the main Hawaiian Islands during European settlement (Riotte 1986). Because the moth was once so widespread and sphinx moths are known to be strong fliers, we believe it is likely inter-island dispersal of the species occurred to some degree prior to the loss of much of its historical habitat. Currently, the areas of dry to mesic shrub and forest habitats below 1,525 m (5,000 ft) that are or could potentially be suitable for the Blackburn's sphinx moth are approximately 148,588 ha (367,161 ac). Thus it appears the moth's range has declined on the order of 82 percent since humans arrived in Hawaii 1,600 years ago (HHP 2000; Kirch 1982).

##### Localized Extirpation

In addition to, or perhaps because of, habitat loss and fragmentation, Blackburn's sphinx moths are also susceptible to seasonal variations and weather fluctuations affecting their quality and quantity of available habitat and food. For example, during times of drought, it is expected nectar availability for adult moths will decrease. During times of decreased nectar availability, life spans of individuals may not be affected, but studies with butterflies have shown marked decreases in reproductive capacity for many species (Center for Conservation Biology Update 1994). In another study, Janzen (1984) reported that host plant availability directly affected sphingid reproductive activity. In fact, for some lepidopteran (butterflies and moths) species, if nectar intake is cut in half, reproduction is also cut approximately in half. Such resource stress may occur on any time scale, ranging from a few days to an entire season, and a pattern of

continuous long-term adult feeding stress could affect the future viability of a population (Center for Conservation Biology Update 1994).

Often, habitat suitability for herbivorous insects is determined by factors other than host plant occurrence or density. Microclimatic conditions (Thomas 1991; Solbreck 1995) and predator pressure (Roland 1993; Roland and Taylor 1995; Walde 1995) are two such widely reported factors. In a study of moth population structure, habitat patch size and the level of sun exposure were shown to affect species occupancy, while patch size and the distance from the ocean coast were reported to affect moth density (Forare and Solbreck 1997). Moth populations in small habitat patches were more likely to become extinct (Forare and Solbreck 1997).

##### Nonnative Arthropods

The geographic isolation of the Hawaiian Islands restricted the number of original successful colonizing arthropods and resulted in the development of an unusual fauna. Only 15 percent of the known insect families are represented by the native insects of Hawaii (Howarth 1990). Some groups that often dominate continental arthropod faunas, such as social Hymenoptera (group-nesting ants, bees, and wasps), are entirely absent from the native Hawaiian fauna. Accidental introductions from commercial shipping and air cargo to Hawaii has now resulted in the establishment of over 2,500 species of alien arthropods (Howarth 1990; Howarth *et al.* 1994), with a continuing establishment rate of 10 to 20 new species per year (Nishida 1997). In addition to the accidental establishment of nonnative species, private individuals and government agencies began importing and releasing nonnative predators and parasites for biological control of pests as early as 1865. This resulted in the introduction of 243 nonnative species between 1890 and 1985, in some cases with the specific intent of reducing populations of native Hawaiian insects (Funasaki *et al.* 1988, Lai 1988). Alien arthropods, whether purposefully introduced or accidental, pose a serious threat to Hawaii's native insects, through direct predation, parasitism, and competition for food or space (Howarth and Medeiros 1989; Howarth and Ramsay 1991).

##### Ants

Ants are not a natural component of Hawaii's arthropod fauna, and native species evolved in the absence of predation pressure from ants. Ants can

be particularly destructive predators because of their high densities, recruitment behavior, aggressiveness, and broad range of diet (Reimer 1993). Because they are often generalist feeders, ants may affect prey populations independent of prey density, and may locate and destroy isolated individuals and populations (Nafus 1993a). At least 36 species of ants have become established in the Hawaiian Islands, and three particularly aggressive species have severely affected the native insect fauna (Zimmerman 1948).

For example, in areas where the big-headed ant (*Pheidole megacephala*) is present, native insects, including most moths, have been eliminated (Gagné 1979; Gillespie and Reimer 1993; Perkins 1913). The big-headed ant generally does not occur at elevations higher than 600 m (2,000 ft), and is also restricted by rainfall, rarely being found in particularly dry (less than 35 to 50 cm (15 to 20 in) annually) or wet (more than 250 cm (100 in) annually) areas (Reimer *et al.* 1990). The big-headed ant is also known to be a predator of eggs and caterpillars of native Lepidoptera, and can completely exterminate populations (Zimmerman 1958). This ant occurs on all the major Hawaiian Islands, including those currently inhabited by Blackburn's sphinx moth and is a direct threat to these populations (Medeiros *et al.* 1993; Nishida 1997; N. Reimer, pers. comm., 2001).

Several additional ant species threaten the conservation of Blackburn's sphinx moth. The Argentine ant (*Linepithema humilis*) has been reported from several islands including Maui, Kahoolawe, and Hawaii (A. Asquith, Service, pers. comm., 1998; A. Medeiros, pers. comm. 1998; Nishida 1997). The long-legged ant (*Anoplolepis longipes*) is reported from several islands including Hawaii and Maui (Hardy 1979). At least two species of fire ants, *Solenopsis geminata* and *Solenopsis papuana*, are also important threats (Gillespie and Reimer 1993; Reagan 1986) and occur on many of the major islands (Nishida 1997; Reimer *et al.* 1990). *Ochetellus glaber*, a recently reported ant introduction, occurs on Maui, Hawaii, and Kahoolawe (A. Medeiros, pers. comm., 1998; Nishida 1997; N. Reimer, pers. comm., 2001).

#### Parasitic Wasps

Hawaii also has a limited fauna of native Hymenoptera wasp species, with only two native species in the family Braconidae (Beardsley 1961), neither of which are known to parasitize Blackburn's sphinx moth. In contrast,

other species of Braconidae are common predators (parasitoids) on the larvae of the tobacco hornworm and the tomato hornworm in North America (Gillmore 1938). There are now at least 74 nonnative species, in 41 genera, of braconid wasps established in Hawaii, of which at least 35 species were purposefully introduced as biological control agents (Nishida 1997). Most species of alien braconid and ichneumonid wasps that parasitize moths are not host-specific, but attack the caterpillars or pupae of a variety of moths (Funasaki *et al.* 1988; Zimmerman 1948, 1978) and have become the dominant larval parasitoids even in intact, high-elevation, native forest areas of the Hawaiian Islands (Howarth *et al.* 1994; Zimmerman 1948). These wasps lay their eggs within the eggs or caterpillars of Lepidoptera. Upon hatching, the wasp larvae consume internal tissues, eventually killing the host. At least one species established in Hawaii, *Hyposoter exiguae*, is known to attack the tobacco hornworm and the related tomato hornworm in North America (Carlson 1979). This wasp is recorded from all of the main islands except Kahoolawe and Lanai (Nishida 1997) and is a recorded parasitoid of the lawn armyworm (*Spodoptera maurita*) on tree tobacco on Maui (Swezey 1927). Because of the rarity of Blackburn's sphinx moths, no documentation exists of alien braconid and ichneumonid wasps parasitizing the species. However, given the abundance and the breadth of available hosts of these wasps, they are considered significant threats to the moth (Gagné and Howarth 1985; Howarth 1983; Howarth *et al.* 1994; F. Howarth, pers. comm., 1994).

Small wasps in the family Trichogrammatidae parasitize insect eggs, with numerous adults sometimes developing within a single host egg. The taxonomy of this group is confusing, and it is unclear if Hawaii has any native species (Nishida 1997, J. Beardsley, University of Hawaii, pers. comm., 1994). Several alien species are established in Hawaii (Nishida 1997), including *Trichogramma minutum*, which is known to attack the sweet potato hornworm in Hawaii (Fullaway and Kraus 1945). In 1929, the wasp *Trichogramma chilonis* was purposefully introduced into Hawaii as a biological control agent for the Asiatic rice borer (*Chilo suppressalis*) (Funasaki *et al.* 1988). This wasp parasitizes the eggs of a variety of Lepidoptera in Hawaii, including sphinx moths (Funasaki *et al.* 1988). Williams (1947) found 70 percent of the eggs of

Blackburn's sphinx moth to be parasitized by a *Trichogramma* wasp that was probably *T. chilonis*. Over 80 percent of the eggs of the alien grasswebworm (*Herpetogramma licarsisalis*) in Hawaii are parasitized by these wasps (Davis 1969). In Guam, *Trichogramma chilonis* effectively limits populations of the sweet potato hornworm (Nafus and Schreiner 1986), and the sweet potato hornworm is considered under complete biological control by this wasp in Hawaii (Lai 1988). While this wasp probably affects Blackburn's sphinx moth in a density-dependent manner (Nafus 1993a), and theoretically is unlikely to directly cause extinction of a population or the species, the availability of more abundant, alternate hosts (any other lepidopteran eggs) may allow for the extirpation of Blackburn's sphinx moth by this or other egg parasites as part of a broader host base (Howarth 1991; Nafus 1993b; Tothill *et al.* 1930).

#### Parasitic Flies

Hawaii has no native parasitic flies in the family Tachinidae (Nishida 1997). Two species of tachinid flies, *Lespesia archippivora* and *Chaetogaedia monticola*, were purposefully introduced to Hawaii for control of army worms (Funasaki *et al.* 1988; Nishida 1997). These flies lay their eggs externally on caterpillars, and upon hatching, the larvae burrow into the host, attach to the inside surface of the cuticle, and consume the soft tissues (Etcheagaray and Nishida 1975b). In North America, *C. monticola* is known to attack at least 36 species of Lepidoptera in eight families, including sphinx moths; *L. archippivora* is known to attack over 60 species of Lepidoptera in 13 families, including sphinx moths (Arnaud 1978). These species are on record as parasites of a variety of Lepidoptera in Hawaii and are believed to depress populations of at least two native species of moths (Lai 1988). Over 40 percent of the caterpillars of the monarch butterfly (*Danaus plexippus*) on Oahu are parasitized by *Lespesia archippivora* (Etcheagaray and Nishida 1975a) and the introduction of a related species to Fiji resulted in the extinction of a native moth there (Howarth 1991; Tothill *et al.* 1930). Both of these species occur on Maui and Hawaii (Nishida 1997) and are direct threats to the Blackburn's sphinx moth.

Based on the findings discussed above, nonnative predatory and parasitic insects are considered important factors contributing to the reduction in range and abundance of the Blackburn's sphinx moth, and in combination with habitat loss and

fragmentation, are a serious threat to its continued existence. Some of these nonnative species were intentionally introduced by the State of Hawaii's Department of Agriculture or other agricultural agencies (Funasaki *et al.* 1988) and importations and

augmentations of lepidopteran parasitoids continues. Although the State of Hawaii requires new introductions be reviewed before release (Hawaii State Department of Agriculture (HDOA) 1994), post-release biology and host range cannot be predicted from

laboratory studies (Gonzalez and Gilstrap 1992; Roderick 1992) and the purposeful release or augmentation of any lepidopteran predator or parasitoid is a potential threat to the conservation of the Blackburn's sphinx moth (Gagné and Howarth 1985; Simberloff 1992).

TABLE 1.—SOME OF THE POTENTIAL NONNATIVE INSECT PREDATORS AND PARASITES OF BLACKBURN'S SPHINX MOTH

Order/family	Genus/species	Major island(s) on which the species has been reported	Major island(s) on which the species has not been reported
Diptera Tachinidae .....	<i>Chaetogaedia monticola</i> .....	Hawaii, Kauai, Lanai, Maui, Molokai, Oahu.	Kahoolawe.
Diptera Tachinidae .....	<i>Lespesia archippivora</i> .....	Hawaii, Kauai, Maui, Molokai, Oahu.	Kahoolawe, Lanai.
Hymenoptera Formicidae .....	<i>Anoplolepis longipes</i> (long-legged ant).	Hawaii, Kauai, Maui, Oahu .....	Kahoolawe, Lanai, Molokai.
Hymenoptera Formicidae .....	<i>Linepithema humilis</i> (Argentine ant).	Hawaii, Kahoolawe, Kauai, Lanai, Maui.	Molokai, Oahu.
Hymenoptera Formicidae .....	<i>Ochetellus glaber</i> .....	Hawaii, Kahoolawe, Kauai, Maui, Oahu.	Lanai, Molokai.
Hymenoptera Formicidae .....	<i>Pheidole megacephala</i> (big-headed ant).	Hawaii, Kahoolawe, Kauai, Lanai, Maui, Molokai, Oahu.	
Hymenoptera Formicidae .....	<i>Solenopsis geminita</i> (fire ant species).	Hawaii, Kauai, Lanai, Maui, Molokai, Oahu.	Kahoolawe.
Hymenoptera Formicidae .....	<i>Solenopsis papuana</i> (fire ant species).	Hawaii, Kauai, Lanai, Maui, Molokai, Oahu.	Kahoolawe.
Hymenoptera Ichneumonidae .....	<i>Hyposeter exiguae</i> .....	Hawaii, Kauai, Maui, Molokai, Oahu.	Kahoolawe, Lanai.
Hymenoptera Trichogrammatidae ..	<i>Trichogramma chilonis</i> .....	Kauai, Oahu .....	Hawaii, Maui, Kahoolawe, Lanai, Molokai.
Hymenoptera Trichogrammatidae ..	<i>Trichogramma minutum</i> .....	Hawaii, Lanai, Molokai, Oahu .....	Kauai, Kahoolawe, Maui.

As Table 1 above indicates, the assemblage of potential alien predators and parasites on each island may differ. Furthermore, the arthropod community may differ from area to area even on the same island based upon elevation, temperature, prevailing wind pattern, precipitation, or other factors (Nishida 1997). Conserving and/or restoring moth populations in multiple locations should decrease the likelihood that the effect of any single alien parasite or predator or combined pressure of such species could result in the diminished vigor or extinction of the moth.

Due to the threats discussed above, we do not believe the existing habitats containing Blackburn's sphinx moth populations are sufficient to ensure the long-term survival of the species. A diverse set of habitats and climates within its former range is necessary to remove the long-term risk of range-wide extinction of the species. Threats to the moth identified in the final listing rule (65 FR 4770) include: vandalism and collection, predation/parasitism by alien arthropods, and habitat alteration and loss from nonnative plant and ungulate invasion. Considering the rarity of the moth, small population size is also believed to be a factor that threatens the long-term survival of the species since random population fluctuations and catastrophic events are more likely to

result in the extirpation of local populations. Wildfire and feral ungulate pressure on the moth's habitat and the direct pressure of alien predators and parasites are important factors currently reducing the moth's range and abundance and threatening the species' continued existence (Funasaki *et al.* 1988).

#### Previous Federal Action

An initial comprehensive Notice of Review for Invertebrate Animals was published in the **Federal Register** on May 22, 1984 (49 FR 21664). In this notice, we identified Blackburn's sphinx moth as a category 3A taxon. Category 3A taxa were those for which we had persuasive evidence of extinction. We published an updated Notice of Review for animals on January 6, 1989 (54 FR 554). Although Blackburn's sphinx moth had been rediscovered by 1985, in the 1989 Notice of Review, this taxon was again identified as category 3A. In the next Notice of Review on November 15, 1994 (59 FR 58982), this species was reclassified as a category 1 candidate for listing. Category 1 candidates were those taxa for which we had on file sufficient information on biological vulnerability and threats to support preparation of listing proposals. Beginning with our February 28, 1996, Notice of Review (61 FR 7596), we

discontinued the designation of multiple categories of candidates, and only those taxa meeting the definition of former category 1 candidates are now considered candidates for listing purposes. In the February 28, 1996, Notice of Review, we identified Blackburn's sphinx moth as a candidate species (61 FR 7596). A proposed rule to list Blackburn's sphinx moth as endangered was published on April 2, 1997 (62 FR 15640). In the September 19, 1997, Notice of Review (62 FR 49398), this species was included as proposed for endangered status.

In the proposed listing rule, we indicated designation of critical habitat for the moth was not prudent because we believed a critical habitat designation would not provide any additional benefit beyond that provided through listing as endangered.

A final listing rule, listing the Blackburn's sphinx moth as endangered, was published in the **Federal Register** on February 1, 2000 (65 FR 4770). In that final rule, we determined that critical habitat designation for the moth would be prudent, and we also indicated that we were not able to develop a proposed critical habitat designation for the species at that time due to budgetary and workload constraints.

On June 2, 2000, we were ordered by the U.S. District Court for the District of Hawaii (in *Conservation Council for Hawaii v. Babbitt*, Civil No. 99-00603 SOM/BMK) to publish the final critical habitat designation for Blackburn's sphinx moth by February 1, 2002. The plaintiffs and the Service have entered into a consent decree stating that we will jointly seek an extension of this deadline (*Center for Biological Diversity, et al. v. Norton*, Civ. No. 01-2063 (JR) (D.D.C.); October 2, 2001). This proposed rule is in response to these requirements.

On January 5, 2001, we mailed pre-proposal notification letters to 45 interested parties informing them that the Service was in the process of designating critical habitat for the Blackburn's sphinx moth and requesting from them information on management of lands that currently or recently (within the past 25 years) supported the Blackburn's sphinx moth. The letters contained a fact sheet describing the Blackburn's sphinx moth and critical habitat and a questionnaire designed to gather information about land management practices, which we requested be returned to us by February 1, 2001. We received 18 responses to our interested parties mailing. Additionally, we met with several researchers and land managers to obtain more specific information on management activities and suitability of certain habitat areas for the Blackburn's sphinx moth. The responses to our notification letters and meetings included information on current land management activities, detailed management plans, new locality information for adult and larval moths, and new locality information for the Blackburn's sphinx moth's host plants.

### Critical Habitat

Critical habitat is defined in section 3 of the Act as—(i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered species or a threatened species to the point at which listing under the Act is no longer necessary.

Critical habitat receives protection under section 7 of the Act through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires consultation on Federal actions likely to affect critical habitat. Aside from the added protection that may be provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private or other non-Federal lands which do not involve a Federal nexus, critical habitat designation would not afford any additional regulatory protections under the Act against such activities.

Critical habitat also provides non-regulatory benefits to the species by informing the public and private sectors of areas important for species recovery and where conservation actions would be most effective. Designation of critical habitat can help focus conservation activities for a listed species by identifying areas containing the physical and biological features essential for conservation of that species, and can alert the public as well as land-managing agencies to the importance of those areas. Critical habitat also identifies areas that may require special management considerations or protection, and may help provide protection to areas where significant threats to the species have been identified or help to avoid accidental damage to such areas.

To be included in a critical habitat designation, the habitat must first be "essential to the conservation of the species." Critical habitat designations identify, to the extent known using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (*i.e.*, areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)).

Section 4 requires that we designate critical habitat based on what we know at the time of the designation. When we designate critical habitat at the time of listing or under court-ordered deadlines, we will often not have sufficient information to identify all areas of critical habitat. We are required, nevertheless, to make a decision and, thus, must base our designations on the best information available we have at that time.

Within the geographic area occupied by the species, we will designate only areas currently known to be essential. We will not speculate about what areas

might be found to be essential if better information became available, or what areas may become essential over time. If the information available at the time of designation does not show that an area provides essential life cycle needs of the species, then the area should not be included in the critical habitat designation.

Our regulations state that, "The Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species" (50 CFR 424.12(e)). Accordingly, when the best available scientific and commercial data do not demonstrate that the conservation needs of the species require designation of critical habitat outside of occupied areas, we will not designate critical habitat in areas outside the geographic area occupied by the species.

Section 4(b)(2) of the Act requires that we take into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. We may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Our Policy on Information Standards Under the Act, published in the **Federal Register** on July 1, 1994 (59 FR 34271), identifies criteria, establishes procedures, and provides guidance to ensure that decisions made by the Service represent the best scientific and commercial data available. It requires Service biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat. When determining which areas are critical habitat, a primary source of information is the listing package for the species. Additional information may be obtained from a recovery plan, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, unpublished materials, and expert opinion or personal knowledge.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, because of the information available to us at the time of designation, we recognize that designation of critical habitat may not include all of the habitat areas that may



eventually be determined to be necessary for the conservation of the species. For these reasons, critical habitat designations do not signal that habitat outside the designation is unimportant or may not be required for recovery. Areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) of the Act, and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the take prohibitions of section 9 of the Act, as determined on the basis of the best available information at the time of the action. Federally funded or assisted projects affecting listed species outside their designated critical habitat areas could still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans, or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

#### Methods

To identify and map areas essential to the conservation of the Blackburn's sphinx moth, we evaluated areas that contain dry and mesic habitats as well as data on known moth occurrence. The best scientific information available was analyzed, including peer-reviewed scientific publications; unpublished reports by researchers; the rule listing the species (65 FR 4770); the Blackburn's sphinx moth Recovery Outline (Service 2000a); the Hawaii Natural Heritage Program (NHP) database; field trip reports in our Pacific Islands Fish and Wildlife Office files; and responses to our moth critical habitat outreach package mailed to Federal, State, private land managers, and other interested parties.

Information that we received in response to our pre-proposal outreach efforts was very helpful in developing this proposed critical habitat designation. Researchers at the Bishop Museum provided new information about the moth's range and the potential effects of nonnative predators and parasites. The Hawaii Division of Forestry of Wildlife provided new information about the biology and distribution of the host plants, new moth observation records, and information on the management activities for State lands. The State Natural Area Reserve Commission provided new information about the moth's biology and information on

management activities. The Kahoolawe Island Reserve Commission provided new information on the moth's range, as well as management activities for the management and restoration of Kahoolawe. Researchers with the Biological Resource Division of the U.S. Geological Survey, the National Tropical Botanical garden, and the Hawaii Natural Heritage Program provided information concerning the distribution of the moth and its host plants. Additional information was received from the Hawaii Army National Guard (HIARNG) and the Hawaii Department of Agriculture (HDOA).

The Blackburn's sphinx moth is short-lived, extremely mobile, and rare; hence population densities are not easily determined (Janzen 1984; A. Medeiros, pers comm., 1998; Roderick and Gillespie 1997; Van Gelder and Conant 1998). Even if the threats responsible for the decline of the moth were controlled, the persistence of existing populations is hampered by the small number of extant populations and the small number of individuals in known populations. This circumstance makes the moth more vulnerable to extinction due to a variety of natural processes. Small populations are particularly vulnerable to reduced reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to random genetic drift, resulting in decreased evolutionary potential and ability to cope with environmental change (IUCN 1994; Lande 1988). Small populations are also demographically vulnerable to extinction caused by random fluctuations in population size and sex ratio and to catastrophes such as hurricanes (Lande 1988). We believe the existing Blackburn's sphinx moth populations on Kahoolawe, Hawaii, and Maui are insufficient to ensure the long-term survival of the species. Re-establishing the species to a diverse set of habitats and climates within its former range is necessary to remove the long-term risk of range-wide extinction of the species due to catastrophic events and the numerous direct threats to the species and its habitat (Service 1997).

Janzen (1984) described the characteristics of tropical sphingid moths found in a Costa Rican National Park. In general, adult sphingids are nocturnal or crepuscular (dusk-flying) and regularly drink with a long proboscis from many kinds of sphingophilous flowers while hovering in front of them. Sphingophilus flowers are characterized by lightly-colored, tubular corollas, evening anthesis (opening), and nocturnal nectar and

scent production (Haber and Frankie 1989). Fecundity was unknown, but estimated in the hundreds if the female can feed freely.

Particularly helpful in understanding the conservation needs of sphingids is Janzen's description of the adult moth biological characteristics, including that they have large latitudinal ranges, feed heavily over a long period of time and extensively at spatially particulate resources relatively fixed in location (i.e., they feed on specific resources spread throughout the landscape), live for weeks to months, lay few eggs per night, probably oviposit (deposit eggs) on many host plant individuals and repeatedly visit many of them, have less synchronous eclosion (emergence from the pupa) during the rainy season than other moths, migrate, and are highly mobile, repeatedly returning to the same food plants. In another study of sphingids, adults were reported to travel greater distances to pollinate and visit flowers than those distances traveled by other insect pollinators or even hummingbirds (Linhart and Mendenhall 1977).

Sphingid caterpillars are known to feed heavily over a long time period and eat limited types of foliage, typically plants rich in toxic small molecules (e.g., in the family Solanaceae). They also have less synchronous eclosion (emergence from the pupa) than other moths. Since sphingids search widely for local good conditions, Janzen concluded that isolated habitats may have difficulty supporting sphingid populations (i.e., connectivity between habitat areas is necessary to support wide-ranging sphingid species).

Ehrlich and Murphy (1987) noted populations of herbivorous insects such as lepidopterans are often regulated by environmental factors, such as weather conditions, and thus small populations can be particularly at risk of extinction. Ehrlich and Murphy identified a number of principles important for the conservation of herbivorous insects. First, in most cases, a series of diverse demographic units will typically be needed to conserve a species. Second, where possible, corridors among the sites should be established to promote re-colonizations in areas where the species once occurred. Lastly, they noted that when populations are very sensitive to environmental changes and limited information is available on the species population biology, it is easy to underestimate the conservation needs of such insects.

Murphy *et al.* (1990) also noted that reviews of butterfly population ecology demonstrate that environmental factors play important roles in determining



butterfly population dynamics. They stated that most documented population extinctions have resulted from habitat deterioration combined with extreme weather events. Decreases in the quality or abundance of larval host plants and adult nectar sources are caused by changes in plant community composition, particularly changes associated with succession, disturbance, and grazing regimes. But, because many butterfly species are especially sensitive to thermal conditions, habitat changes which disrupt microclimatic regimes can cause habitat deterioration without elimination of plant resources. Ehrlich and Murphy (1987) noted several patterns within typical butterfly populations: a number of subpopulations within a given species metapopulation are often extirpated and later re-colonized; and a given species may not be present in many of its habitat remnants, including within those containing the highest host plant diversity.

Section 3(5)(A)(i) of the Act provides that areas outside the geographical area currently occupied by the species may meet the definition of critical habitat upon determination that they are essential for the conservation of the species. Although our knowledge of the moth's historical range is incomplete, we believe the existing natural habitats needed to support viable populations of the moth are too small, isolated, and seriously threatened to ensure its long-term protection or conservation, particularly in light of the foraging needs of adult sphingid moths (Janzen 1984) and the apparent wide-ranging Blackburn's sphinx moth foraging habits (HHP 2000; F. Duvall, pers. comm., 2001; B. Gagné, pers. comm., 2001; D. Hopper, *in litt.*, 2000, 2002). Long-term conservation of the species will require the protection and subsequent restoration of additional and larger areas of dry and mesic habitat that includes the larval and adult primary constituent elements at different elevational and rainfall gradients to improve the likelihood of successful larval development and adult moth foraging (A. Medeiros, pers. comm., 1998; Roderick and Gillespie 1997; Van Gelder and Conant 1998). The long-term persistence of the existing populations would improve if they could be increased in size and if the connectivity among the populations was enhanced, thus promoting dispersal of individuals across intervening lands, and conserving and restoring moth populations in multiple locations would decrease the likelihood that the effect of any single alien parasite or predator or

combined pressure of such species could result in the diminished vigor or extinction of the moth.

Molokai is an example of essential habitat because it provides for the expansion of the species' range and for improved connectivity of the different populations. While the proposed unit on this island is not known to currently harbor a moth population, preserving this habitat is important because some threats to the species are absent there (Table 1 shows several of the potential moth predators and parasites are not reported on this island). Likewise, because of Molokai's distance from islands currently inhabited by the moth, we believe proposed critical habitat on this island will be extremely important for the species' conservation as it would help to protect the species from extinction by catastrophic events, which could impact other more closely grouped populations (e.g., those on the Maui or on the island of Hawaii). For these reasons, we find that inclusion of an area such as on Molokai, identified as containing the primary constituent elements is essential to the conservation of the species even if it does not currently contain known moth populations.

The critical habitat unit approach in this proposed rule addresses the numerous risks to the long-term survival and conservation of Blackburn's sphinx moth by employing two widely recognized and scientifically accepted methods for promoting viable populations of imperiled species—(1) Creation or maintenance of multiple populations to reduce the threat of a single or series of catastrophic events extirpating the species; and (2) increasing the size of each population in the respective critical habitat units to a level where the threats of genetic, demographic, and normal environmental uncertainties are diminished (Meffe and Carroll 1996; Service 1997; Tear *et al.* 1995).

In general, the larger the number of populations and the larger the size of each population, the lower the probability of extinction (Meffe and Carroll 1996; Raup 1991). This basic conservation principle of redundancy applies to Blackburn's sphinx moth. By maintaining viable populations in the proposed critical habitat units, the threats represented by a fluctuating environment are reduced and the species has a greater likelihood of achieving long-term survival and conservation. Conversely, loss of a Blackburn's sphinx moth critical habitat unit will result in an appreciable increase in the risk that the species may not recover and survive.

Due to the species' presently reduced range, the Blackburn's sphinx moth is now more susceptible to the variations and weather fluctuations affecting quality and quantity of available habitat and food. Furthermore, the moth is now more susceptible to direct pressure from numerous nonnative insect predators and parasites. For these reasons and the reasons discussed above, those areas currently occupied would be inadequate to ensure the conservation of the species, and we have proposed to designate eight units on four islands.

We are developing a draft recovery plan for this species. The overall objective of this recovery plan will be to ensure the species' long-term conservation and identify research necessary so the moth can be reclassified to threatened and ultimately removed from the lists of endangered and threatened species. Because a recovery plan for the moth has not yet been completed, in making this determination we evaluated the remaining potential habitat, the biological and life history characteristics of the moth, and the best available scientific information on conservation planning to obtain what we currently believe will be required to ensure viable populations of this species. However, if after completing the recovery planning process, should our understanding of what areas support essential features for the conservation of the moth change, to the extent our resources and other duties will allow, we would revise any existing critical habitat designation accordingly.

#### Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas to designate as critical habitat, we must consider those physical and biological features essential to the conservation of the species, and which may require special management considerations and protection. These include, but are not limited to, space for individual and population growth and for normal behavior; food, water, or other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, or egg laying. To the extent possible, these biological and physical elements, also known as primary constituent elements are, to be described with the critical habitat designation.

The primary constituent elements for the Blackburn's sphinx moth include specific habitat components identified as essential for the primary biological needs of foraging, sheltering, maturation, dispersal, breeding, and egg

laying, and are organized by life cycle stage. The primary constituent elements required by the Blackburn's sphinx moth larvae for foraging, sheltering, maturation, and dispersal are the two documented host plant species within the endemic *Nothocestrum* genus (*N. latifolium* and *N. breviflorum*) and the dry and mesic habitats between the elevations of sea level and 1,525 m (5,000 ft) and receiving between 25 and 250 cm (10 and 100 in) of annual precipitation which currently support or historically have supported these plants. The primary constituent elements required by Blackburn's sphinx moth adults for foraging, sheltering, dispersal, breeding, and egg production are native, nectar-supplying plants, including but not limited to *Ipomoea indica* (and other species within the genus *Ipomoea*), *Capparis sandwichiana*, and *Plumbago zeylanica* and the dry to mesic habitats between the elevations of sea level and 1,525 m (5,000 ft) and receiving between 25 and 250 cm (10 and 100 in) of annual precipitation which currently support or historically have supported these plants.

Both the larval and adult food plants are found in undeveloped areas supporting mesic and dry habitats, typically receiving less than 250 cm (100 in) of rain per year and are located between the elevations of sea level and 1,525 m (5,000 ft). Vegetative communities in these areas include native plants, and in some instances, introduced plant species (A. Medeiros, pers. comm., 1998; Roderick and Gillespie 1997; Van Gelder and Conant 1998).

Although Blackburn's sphinx moth larvae feed on the nonnative *Nicotiana glauca*, we do not consider this plant to be a primary constituent element for the designation of critical habitat. As previously discussed, the native *Nothocestrum* species are more stable and persistent components of dry to mesic forest habitats than the *Nicotiana glauca*. *Nicotiana glauca* is a short-lived species that may disappear from areas during prolonged drought (A. Medeiros, pers. comm., 1998) or during successional changes in the plant community (F. Howarth, pers. comm., 2001; Symon 1999). Many studies have shown that insects, and particularly lepidopteran larvae, consume more food when the food has a relatively high water content (Murugan and George 1992). Relative consumption rate and growth have been reported to decrease for many sphingids (closely related to the Blackburn's sphinx moth) when raised on host plants or diets with a relatively low water content (Murugan and George 1992). *Nicotiana glauca*'s

vulnerability to drought conditions suggests that its water content frequently may not be suitable for optimal growth of Blackburn's sphinx moth larvae.

The restoration of native host species for the moth and other endangered species may also require the control or elimination of nonnative vegetation. Additionally, unlike the *Nothocestrum* species, *Nicotiana glauca* is more likely to occur in habitats less suitable due to their occupation by alien insect predators (D. Hopper, Service, *in litt.*, 2000, 2002; Symon 1999). Therefore, in comparison with *Nicotiana glauca*, the native *Nothocestrum* species better fulfill the primary biological needs of the moth larvae. For all of these reasons, we are not considering *Nicotiana glauca* as a primary constituent element for the designation of critical habitat at this time.

#### Criteria Used To Identify Critical Habitat

We used several criteria to identify and select lands proposed for designation as critical habitat. We began with all areas that we believe are currently occupied by the moth. We then added other unoccupied lands containing the primary constituent elements that are needed for conservation of the species. As discussed in the Methods section, in deciding which unoccupied areas were needed for conservation we based our decision on the amount of available habitat remaining that could potentially support the moth, the biology of the moth, and information gained from the conservation of other herbivorous insects. We gave preference to lands that—(a) are known to contain largely intact assemblages of the host plant communities, and (b) form contiguous, relatively large areas of suitable habitat.

Regular flight distances of sphingids in Central America may be greater than 10 km (6.2 mi) (Janzen 1984), and given the large size and strong flight capabilities of the Blackburn's sphinx moth, the species is believed to use large areas of habitat. Therefore, moth population linkages will likely be enhanced if designated habitat occurs in large contiguous blocks or within a matrix of undeveloped habitat (McIntyre and Barrett 1992; A. Medeiros, pers. comm., 1998; S. Montgomery, pers. comm., 2001; Roderick and Gillespie 1997; Van Gelder and Conant 1998). To the extent possible with the limited potential habitat remaining, we have attempted to account for the wide-ranging behavior of the moth. Since the Blackburn's sphinx moth is believed to be a strong flier and is able to move

many kilometers from one area to another, areas of larval or adult presence and feeding may be separated from similar habitat areas and still serve important functions in maintaining moth populations.

Some small habitat areas are also suitable for Blackburn's sphinx moth larvae (e.g., Unit 3 and Units 5a and 5b discussed below) and are critical for the conservation of the moth since such habitats may facilitate adult moth dispersal and promote genetic exchange between populations located on different islands. These areas also provide nectar resources and sheltering opportunities required by the adult moth. As discussed earlier, small, geographically isolated populations may be subject to decreased viability caused by inbreeding depression, reductions in effective population size due to random variation in sex ratio, and limited capacity to evolve in response to environmental change (Soulé 1987).

Blackburn's sphinx moth populations fluctuate from year to year and season to season, apparently correlated with environmental and climatic variation. The moth is likely sensitive to thermal conditions and habitat changes which disrupt its micro-climatic requirements. Therefore, proposed critical habitat boundaries include dry and mesic habitats containing the primary constituent elements along wide elevational gradients to better ensure adult moth foraging needs up and downslope within its range. Furthermore, the boundaries include elevational gradients to better ensure larval host plant availability during periods of drought. The growth rates of larvae for many closely related sphingid species are reported to decrease when their host plants lack suitable water content. In fact, suitable host plant water content can improve the later fecundity of the adult stage (Murugan and George 1992). It is believed numerous habitat elevations, containing the various primary constituent elements, are necessary for successful conservation of the species (Ehrlich and Murphy 1987; Murphy and Weiss 1988; Murphy *et al.* 1990; Shaffer 1987) to minimize the effects of annual localized drought conditions throughout different areas of the species' host plant range (Murugan and George 1992).

Many sphingid studies have shown that air temperature restricts adult feeding activity above a certain temperature (usually 30 degrees Celsius) (Herrera 1992). This highlights the importance of protecting sufficiently large habitat areas throughout the Blackburn's sphinx moth range to ensure nectar resource availability as

temperatures change within the habitat range seasonally, during the night, and along elevational gradients. Increasing the potential for adult dispersal will help to alleviate many threats, thus, habitat which provides the primary constituent elements associated with adult dispersal and feeding is essential to the conservation of the Blackburn's sphinx moth.

Critical habitat is proposed on those Hawaiian Islands where the Blackburn's sphinx moth's primary constituent elements considered essential for the conservation of the species are known to occur. This will allow the species the ability to persist and re-colonize areas where it has become extirpated due to catastrophic events or demographic stochasticity (randomness) (Shaffer 1987). For example, on the island of Kauai in 1992, Hurricane Iniki blew over large areas of native forest leaving open areas where nonnative plants became established and created paths for further invasion of nonnative animals, both of which have been identified as threats to the survival of the moth.

Small habitats tend to support small populations, which frequently are extirpated by events that are part of normal environmental variation. The continued existence of such satellite populations requires the presence of one or more large reservoir populations, which may provide colonists to smaller, outlying habitat patches (Ehrlich and Murphy 1987). Based on recent field observations of the moth, we believe the species likely occurs within two regional populations on separate islands, one centered in the Kanaio area of leeward East Maui (Unit 1—see Proposed Critical Habitat Designation, below), and one centered near Puuwaawaa (Unit 6) of Hawaii Island, north of Kailua-Kona (F. Howarth, pers. comm., 2001; A. Medeiros, pers. comm., 1998). Both of these two areas contain populations of the moth regarded as probable source areas or "reservoirs" (Murphy *et al.* 1990) for dispersing or colonizing moth adults. We are also proposing areas (e.g., Auwahi Forest and portions of Ulupalukua Ranch, both within Unit 1; and Unit 4 on Kahoolawe) that are large, mixed-quality habitat patches containing the primary constituent elements and located within several kilometers of the two potential reservoir populations. Because of their current occupancy and their proximity to larger populations, it appears likely that they will be the areas most rapidly re-colonized by the moth after potential extirpations.

The designation of small habitat areas close to the two large reservoir areas is

also proposed to promote genetic variability in the moth population, contributing to the long-term persistence and conservation of the species. These areas will serve as stepping stones or corridors for dispersing adult moths or as overflow habitat during particularly fecund years, which could be very important to the integrity of moth populations. For example, adult moths observed at Ahihi-Kinau NAR (Unit 1) on Maui may have originated from larval host plants located in the Kanaio NAR (also Unit 1), or moths seen in Kailua-Kona (Units 5–A and 5–B) from Puuwaawaa (Unit 6). The Blackburn's sphinx moth populations inhabiting these smaller habitat areas appear to be taking advantage of lower elevation adult native host plants and nonnative host plants such as tree tobacco upon which the larval stage is completed successfully. In addition, these small habitat areas may be able to support persistent moth populations independent of the reservoir areas, significantly contributing to conservation of the species.

Natural areas of suitable native, dry to mesic habitat containing at least one *Nothoctrum* plant adjacent or near other *Nothoctrum* populations are included in the proposed critical habitat units. We have included suitable habitat without *Nothoctrum* larval host plants, provided it contained the adult primary constituent elements, including but not limited to *Ipomoea* species, *Capparis sandwichiana*, or *Plumbago zeylanica*. This is especially true for areas lying between or adjacent to large populations of *Nothoctrum* species and which could serve as a flight corridor or "stepping stone" to other larger host plant habitat areas. An area may also serve as a stepping stone when it contains adult native host plants thereby providing foraging opportunities for adults. Areas with larval nonnative host plants (e.g., Unit 3 on Maui and Unit 4 on Kahoolawe) may also serve as areas for population expansion during especially wet years when the nonnative larval host plants experience rapid growth. Natural areas of primarily native vegetation containing the larval or adult stage primary constituent elements and where habitat could support a moth population and increase the potential for conservation are also proposed to be designated as critical habitat. The designation and protection of a unit not known to currently contain a moth population (*i.e.*, the unit on Molokai), but which contains the PCE's and lacks some of the serious threats to the

species, (see Table 1) will enhance population expansion and connectivity, thereby improving the likelihood of the species' conservation.

The areas we are proposing to designate as critical habitat provide some or all of the known primary constituent elements for this species. These areas are on the islands of Hawaii, Kahoolawe, Maui, and Molokai between the elevations of sea level to 1,525 m (5,000 ft) within dry to mesic shrub lands or forests containing one or more populations of the adult host plants, or one or more populations of *Nothoctrum latifolium* or *N. breviflorum*. Proposed critical habitat boundaries include aggregations of native host plant habitat for both larvae and adults, and encompass the areas and flight corridors believed necessary to sustain moth populations.

In summary, the long-term survival and recovery of the Blackburn's sphinx moth requires the designation of eight critical habitat units on four of the main Hawaiian Islands. One of these habitat units is currently not known to be occupied by the Blackburn's sphinx moth. To recover the species, it will be necessary to conserve suitable habitat in this unoccupied unit, which in turn will allow for the establishment of an additional Blackburn's sphinx moth population(s) through natural recruitment or managed re-introductions. Establishment of this additional moth population(s) will increase the likelihood that the species will survive and recover in the face of normal and random events (e.g., hurricanes, fire, alien species introductions, etc.) (Mangel and Tier 1994; Pimm *et al.* 1998; Stacy and Taper 1992).

The lack of scientific data on Blackburn's sphinx moth life history makes it impossible for us to develop a quantitative model (e.g., population viability analysis (NRC 1995)) to identify the optimal number, size, and location of critical habitat units (Bessinger and Westphal 1998; Ginzburg *et al.* 1990; Karieva and Wennergren 1995; Menges 1990; Murphy *et al.* 1990; Taylor 1995). At this time, we are only able to conclude that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of the Blackburn's sphinx moth's long-term survival and recovery. Therefore, we used the best available information, including scientific opinion and professional judgement of non-Service scientists, to identify as critical habitat a reasonable number of additional units. Conservation of more than eight units could further increase the probability

that the species will survive and recover; however, establishing and conserving viable moth populations on a total of eight discrete units on four islands will provide the species with a reasonable expectation of persistence

and eventual recovery, even with the high potential that one or more of these subpopulations will be temporarily lost as a result of normal or random adverse events (Mangel and Tier 1994; Pimm *et al.* 1998; Stacey and Taper 1992).

#### Proposed Critical Habitat Designation

The approximate area encompassing the proposed designation of critical habitat by island and landownership is shown in Table 2.

TABLE 2.—APPROXIMATE PROPOSED CRITICAL HABITAT FOR THE BLACKBURN'S SPHINX MOTH IN HECTARES (ha) (ACRES (ac)) BY ISLAND AND LAND OWNERSHIP (AREA ESTIMATES REFLECT CRITICAL HABITAT UNIT BOUNDARIES, NOT PRIMARY CONSTITUENT ELEMENTS WITHIN)

Critical habitat unit	Island	State	Federal	Private	Total
1. Ahihi-Kinau NAR—Ulupalakua—Auwahi—Kanaio Maui Meta Unit.	Maui	11,504 ha 27,316 ac	1 ha 2 ac	4,161 ha 10,281 ac	15,216 ha 37,599 ac
2. Puu O Kali Unit	Maui	1,791 ha 4,425 ac	0 ha 0 ac	959 ha 2,369 ac	2,750 ha 6,794 ac
3. Kanaha Pond—Spreckelsville Unit	Maui	213 ha 527 ac	0 ha 0 ac	13 ha 31 ac	226 ha 559 ac
4. Upper Kahoolawe Unit	Kahoolawe	1,878 ha 4,641 ac	0 ha 0 ac	0 ha 0 ac	1,878 ha 4,641 ac
5-A. Kailua-Kona Unit A	Hawaii	6 ha 15 ac	0 ha 0 ac	119 ha 294 ac	125 ha 309 ac
5-B. Kailua-Kona Unit B	Hawaii	105 ha 258 ac	0 ha 0 ac	0 ha 0 ac	105 ha 258 ac
6. Puuwaawaa—Hualalai Meta Unit	Hawaii	12,847 ha 31,746 ac	0 ha 0 ac	5,264 ha 13,007 ac	18,111 ha 44,753 ac
7. Kamoko Flats—Puukolekole Unit	Molokai	551 ha 1,362 ac	0 ha 0 ac	1,278 ha 3,158 ac	1,829 ha 4,520 ac
Total		28,445 ha 70,290 ac	1 ha 2 ac	11,794 ha 29,140 ac	40,240 ha 99,433 ac

The areas we are proposing to designate as critical habitat currently provide some or all of the habitat components necessary to meet the primary biological needs of the Blackburn's sphinx moth. Lands designated are under Federal, private, and State ownership. Lands proposed as critical habitat have been divided into eight critical habitat units.

We are proposing to designate critical habitat on lands considered essential to the conservation of the moth. Conserving the moth includes the need to re-establish historic and possibly, extirpated populations of Blackburn's sphinx moth to areas within one of the critical habitat units, which represent a range of habitat and climate conditions within the moth's former range. Re-establishing the species to a diverse set of habitats and climates containing the primary constituent elements is necessary to reduce the long-term risk of range-wide extinction of the species (Service 1997).

A brief description of each unit, and reasons for proposing to designate it as critical habitat are presented below.

#### Unit 1: Ahihi-Kinau NAR—Ulupalakua—Auwahi—Kanaio Unit (Maui)

Unit 1 consists of approximately 15,216 ha (37,599 ac) encompassing portions of the leeward slope of

Haleakala. The unit is bounded on the northeast by the 1,525 m (5,000 ft) elevation contour of Haleakala Volcano, to the south by the ocean, to the east by the dry coast and slopes toward Kaupo Gap, and on the west by the Haleakala Southwest Ridge. Natural features within the unit include widely spread, remnant dry forest communities, rocky coastline, numerous cindercones, and some of the most recent lava flows on Maui. Vegetation consists primarily of mixed-species mesic, and dry forest communities composed of native and introduced plants, with smaller amounts of dry coastal shrub land (HHP 1993).

This unit contains what is probably the largest, extant moth population or meta-population. This unit is essential to the species' conservation because it contains native (*Nothocestrum latifolium*) and other nectar-supplying plants for adult moths. In addition to providing essential habitat for the Maui meta-population, areas within this unit provides temporary (ephemeral) habitat for migrating Blackburn's sphinx moths.

#### Unit 2: Puu O Kali Unit (Maui)

Unit 2 consists of approximately 2,750 ha (6,794 ac) encompassing portions of the leeward slope of Haleakala, and adjacent portions of the upper, southeast isthmus. The unit is bounded on the north and to the south

by pasture lands, to the east by the lower slopes of Haleakala below the area of Kula, and on the west by the coastal town of Kihei. Natural features within the unit include widely spread, remnant dry forest communities, rugged aa lava flows, and numerous cindercones including the highly visible, Puu O Kali. Vegetation consists primarily of mixed-species mesic, and dry forest communities composed of native and introduced plants, with smaller amounts of dry coastal shrub land (HHP 1993). This unit is essential to the species' conservation because it contains native nectar-supplying plants for adult, and areas within this unit provide temporary (ephemeral) habitat for migrating Blackburn's sphinx moths.

#### Unit 3: Kanaha Pond—Spreckelsville Unit (Maui)

Unit 3 consists of approximately 226 ha (559 ac) encompassing portions of the Kahului coastland and the Kanaha Pond State Sanctuary on Maui. It is bounded on the south by the Kahului Airport, on the north by the ocean, on the east by sugarcane fields, and to the west by the town of Kahului. Natural features within the unit include Kanaha Pond and remnant coastal dune communities. Vegetation consists primarily of mixed-species, dry coastal shrub land communities composed of native and introduced plants, including

nonnative larval host plants (HHP 2000).

Although devoid of naturally occurring *Nothoestrus* spp., the unit contains adult moth primary constituent elements, and recent observations of both larvae and adults have been documented in the Kanaha-Spreckelsville area. This unit is also considered essential to the species' conservation because evidence indicates that it provides refuge for moths dispersing to other larger areas. Because it is a State Wildlife Sanctuary, the Kanaha Pond portion of this unit is currently managed to benefit resident native species and should benefit the moth and its host plants to some extent (F. Duvall, DoFAW, *in litt.* 2001). Although this area is lower in elevation than areas containing *Nothoestrus* and associated species, the persistent occurrence of Blackburn's sphinx moth in this area suggests this site plays an important role in moth population dynamics.

*Unit 4: Upper Kahoolawe Unit (Kahoolawe)*

Unit 4 consists of approximately 1,878 ha (4,641 ac), encompassing portions of the upper elevational contour of Kahoolawe, approximately above 305 m (1,000 ft) in elevation. Kahoolawe is located approximately 11 km (6.7 mi) south of Maui Island and is approximately 11,655 ha (28,800 ac) in total land area. Natural features within the unit include the main caldera, Lua Makika, and Puu Moaulaiki. Vegetation within the proposed unit consists primarily of mixed-species, mesic and dry grass and shrubland communities composed of primarily introduced plants and some native plant species (HHP 2000).

This unit contains a large moth population, which may or may not be part of the larger Maui populations. No native *Nothoestrus* species currently occur, but introduced tree tobacco is very common as are numerous native adult host plants as described by the primary constituent elements. Currently, the entire island is devoid of ungulates and is managed for control of fire and nonnative species to some degree. Because the unit harbors adult native host plants and is in close proximity to the large Maui moth population, this unit is essential for Blackburn's sphinx moth conservation and would improve dispersal and migration corridors and thus expand population recruitment potential. (P. Higashino, pers. comm., 2001).

*Unit 5-A and Unit 5-B: Kailua-Kona Unit (Hawaii)*

Units 5-A and 5-B consists of approximately 230 ha (567 ac) encompassing portions of rugged lowland forest within the boundary of the Kailua-Kona township on the island of Hawaii. They are bounded on the south by Kailua-Kona town, on the north by rugged lava flows, to the west by coastal nonnative plant communities, and to the east by residential housing areas. Natural features within the units include rugged lava flows. Vegetation consists primarily of mixed-species mesic, and dry forest communities composed of native and introduced plants, with smaller amounts of dry coastal shrubland (HHP 2000). These units contains the endangered larval host plant, *N. breviflorum*. Adult and larval moth sightings have been documented within these units. In addition to providing habitat for this moth population, lands proposed for designation in Units 5-A and 5-B will provide refugia for moths migrating to other areas of existing suitable host plant habitat.

*Unit 6: Puuwaawaa—Hualalai Meta-Unit (Hawaii)*

Unit 6 consists of approximately 18,111 ha (44,753 ac) encompassing portions of the flows and northwest slopes of the Hualalai volcano on the island of Hawaii. It is bounded on the south by the Kailua-Kona region and large expanses of barren lava flows, on the north by Parker Ranch and large expanses of nonnative grass lands, to the east by upper slopes of Hualalai volcano, and to the west by lava flows and coastland. Natural features within the unit include the Puuwaawaa cindercone and significant stands of native, dry forest including large numbers of *Nothoestrus breviflorum* host plants (Perry 2001). Vegetation consists primarily of mixed-species mesic, and dry forest communities composed of native and introduced plants, with smaller amounts of dry coastal shrubland (HHP 2000).

Frequent and persistent observations of both moth larvae and adults throughout this unit indicate that this unit contains the largest population of Blackburn's sphinx moth on the island of Hawaii. In addition to providing habitat for this population, proposed lands in Unit 6 provide refugia for migrating moths to other areas of existing suitable host plant habitat. As previously discussed, given the large size and strong flight capabilities of the Blackburn's sphinx moth, support for moth population linkages requires

habitat in large contiguous blocks or within a matrix of undeveloped habitat (McIntyre and Barrett 1992; A. Medeiros, pers. comm., 1998; S. Montgomery, pers. comm., 2001; Roderick and Gillespie 1997; Van Gelder and Conant 1998).

*Unit 7: Kamoko Flats—Puukolekole Unit (Molokai)*

Unit 7 consists of approximately 1,829 ha (4,520 ac) encompassing portions of the higher, yet drier portions of east Molokai. It is bounded on the north by wet forests, to the south by drier coastland, to the east by rugged, dry gullies and valleys, and to the west by dry to mesic, lowland forest. Natural features within the unit include numerous forested ridges and gullies. Vegetation consists primarily of mixed-species mesic, and dry forest communities composed of native and introduced plants (HHP 2000).

This unit is part of the historical range of the moth. This unit is not known to currently contain a moth population, but it does contain native *Nothoestrus* host plants, including *N. longifolium* and *N. latifolium* (Wood 2001a) as well as adult native host plants. Because the Molokai unit contains both larval and adult native host plants and is in close proximity to the large Maui population, this unit is essential for Blackburn's sphinx moth conservation because it would allow the species to expand into an area formerly part of its historical range and in very close proximity to its current range on the island of Maui. Furthermore, it may facilitate dispersal and provide a flight corridor for moths eventually migrating to the island of Oahu, also part of its historical range.

Due to its proximity to the island of Maui where the current and presumed highest historical concentration of Blackburn's sphinx moth occurred and because this unit contains dry and mesic habitats which are known, both currently and historically, to support the larval and adult native host plants, researchers believe Blackburn's sphinx moth will re-establish itself on this unit over time. (F. Howarth, pers. comm., 2001). Furthermore, this unit lacks some of the serious potential threats to the moth (see Table 1). Conserving and restoring moth populations in multiple locations will decrease the likelihood that the effect of any single alien parasite or predator or combined pressure of such species and other threats could result in the diminished vigor or extinction of the moth. Including this unit within the designation will also reduce the possibility of the species' extinction from catastrophic events impacting the

existing populations on other islands. Designating Blackburn's sphinx moth critical habitat within this area on Molokai is complementary to existing and planned management activities of the landowners. The proposed critical habitat unit lies within a larger, existing, conservation area to be managed for watershed conservation and the conservation of endangered and rare species. The landowners, State and Federal resource agencies, and local citizens groups are involved with these planned natural resource management activities on Molokai.

*Application of the Section 3(5)(A) Criteria Regarding Special Management Considerations or Protection*

Pursuant to the definition of critical habitat in section 3 of the Act, any area so designated must also require "special management considerations or protections." Special management and protection are not required if adequate management and protection are already in place. Adequate special management or protection is provided by a legally operative plan or agreement that addresses the maintenance and improvement of the primary constituent elements important to the species and manages for the long-term conservation of the species. If any areas containing the primary constituent elements are currently being managed to address the conservation needs of Blackburn's sphinx moth and do not require special management or protection, such areas would not be included in a critical habitat designation because they would not meet the definition of critical habitat in section 3(5)(A)(i) of the Act.

We used the following three guidelines to determine if a plan provides adequate management or protection—(1) A current plan specifying the management actions must be complete and provide sufficient conservation benefit to the species, (2) the plan must provide assurances that the conservation management strategies will be implemented, and (3) the plan must provide assurances that the conservation management strategies will be effective. In determining if management strategies are likely to be implemented, we considered whether: (1) A management plan or agreement exists that specifies the management actions being implemented or to be implemented; (2) there is a timely schedule for implementation; (3) there is a high probability that the funding source(s) or other resources necessary to implement the actions will be available; and (4) the party(ies) have the authority and long-term commitment to the agreement or plan to implement the

management actions, as demonstrated, for example, by a legal instrument providing enduring protection and management of the lands. In determining whether an action is likely to be effective, we considered whether: (1) The plan specifically addresses the management needs, including reduction of threats to the species; (2) such actions have been successful in the past; (3) there are provisions for monitoring and assessment of the effectiveness of the management actions; and (4) adaptive management principles have been incorporated into the plan.

Based on information provided to us by land owners and managers to date, we find that no areas are adequately managed and protected to address the threats to Blackburn's sphinx moth. Several areas, especially within Units 1, 2, 4, 6, and 7 are covered under current management plans and are being managed in a manner that meets some of the conservation needs of Blackburn's sphinx moth including fire and ungulate management. However, we find that in none of these areas does the present management adequately address the needs of the species by reducing all of the primary threats to this species including the loss of host plant fecundity. Furthermore, all of the plans lack a timely schedule for implementation; a high probability of funding source(s) or other resources necessary to implement the necessary actions; and sufficient landowner/management authority or long-term commitment to implement the management actions, as demonstrated, for example, by a legal instrument providing enduring protection and management of the lands.

**Effects of Critical Habitat Designation**

*Section 7 Consultation*

Section 7(a) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out do not destroy or adversely modify critical habitat. Destruction or adverse modification occurs when a Federal action directly or indirectly alters critical habitat to the extent that it appreciably diminishes the value of critical habitat for the conservation of the species. Individuals, organizations, States, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that

is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated or proposed. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with us on any action that is likely to result in destruction or adverse modification of proposed critical habitat. Conference reports provide conservation recommendations to assist the agency in eliminating conflicts that may be caused by the proposed action. The conservation recommendations in a conference report are advisory. We may issue a formal conference report if requested by a Federal agency. Formal conference reports on proposed critical habitat contain a biological opinion that is prepared according to 50 CFR 402.14, as if critical habitat were designated. We may adopt the formal conference report as the biological opinion when critical habitat is designated, if no significant new information or changes in the action alter the content of the opinion (see 50 CFR 402.10(d)).

Section 7 of the Act and its implementing regulations require Federal agencies to consult with us if a proposed action may affect a listed species or its critical habitat (16 U.S.C. 1536; 50 CFR 402.14(a)). If after consultation, we issue a biological opinion concluding that a project is likely to result in the destruction or adverse modification of critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. Reasonable and prudent alternatives are defined at 50 CFR 402.02 as alternative actions identified during consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid destruction or adverse modification of critical habitat. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project.

Regulations at 50 CFR 402.16 require Federal agencies to reinstitute consultation on previously reviewed actions in instances where critical habitat is subsequently designated and the Federal agency has retained discretionary involvement or control over the action or such discretionary involvement or control is authorized by law. Consequently, some Federal agencies may request re-initiation of consultation with us on actions for

which formal consultation has been completed if those actions may affect designated critical habitat.

Activities on Federal lands that may affect the Blackburn's sphinx moth or its critical habitat will require section 7 consultation. Activities on non-Federal lands requiring a permit from a Federal agency, such as a permit from the U. S. Army Corps of Engineers under section 404 of the Clean Water Act, or some other Federal action, including funding (e.g., the Federal Highway Administration, Federal Aviation Administration, Federal Emergency Management Agency, or Natural Resources Conservation Service) will also be subject to the section 7 consultation process. Federal actions not affecting listed species or critical habitat and actions on non-Federal lands that are not federally funded or permitted do not require section 7 consultation.

Section 4(b)(8) of the Act requires us to evaluate briefly in any proposed or final regulation that designates critical habitat those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. We note that such activities may also jeopardize the continued existence of the species. Activities that may directly or indirectly adversely affect critical habitat include, but are not limited to:

(1) Removing, thinning, or destroying Blackburn's sphinx moth habitat (as defined in the primary constituent elements discussion), whether by burning, mechanical, chemical, or other means (e.g., wood cutting, grading, overgrazing, construction, road building, mining, herbicide application, etc.).

(2) Appreciably decreasing habitat value or quality through indirect effects (e.g., introduction or promotion of invasive plant species, forest fragmentation, overgrazing, augmentation of feral ungulate populations, water diversion or impoundment, groundwater pumping, or other activities that alter water quality or quantity to an extent that they affect vegetation structure) and activities that increase the risk of fire.

Federal agencies already consult with us on activities in areas currently occupied by the species to ensure that their actions do not jeopardize the continued existence of the species. Thus, actions which may already require consultation include, but are not limited to:

(1) Development on private or State lands requiring funding or authorization from other Federal agencies, such as the

Department of Housing and Urban Development;

(2) Military training or similar activities of the U.S. Department of Defense (Army, Navy, and National Guard) on State-owned lands (e.g., Kanaio Training Area);

(3) Construction of communication sites licensed by the Federal Communications Commission;

(4) Road construction and maintenance, right-of-way designation, and regulation of agricultural activities by Federal agencies;

(5) Hazard mitigation and post-disaster repairs funded by the Federal Emergency Management Agency; and

(6) Activities not previously mentioned that are funded or authorized by the U.S. Department of Agriculture (Forest Service, Natural Resources Conservation Service), Department of Defense, Department of Transportation, Department of Energy, Department of the Interior (U.S. Geological Survey, National Park Service), Department of Commerce (National Oceanic and Atmospheric Administration), Environmental Protection Agency, or any other Federal agency.

Upon publication of this proposed rule, Federal agencies would also be required to confer with the Service on effects to critical habitat if such actions may destroy or adversely modify proposed critical habitat. Upon publication of a final rule designating critical habitat, Federal agencies would need to include consideration of effects to critical habitat in consultations on these actions.

If you have questions regarding whether specific activities would constitute adverse modification of critical habitat, contact the Field Supervisor, Pacific Islands Ecological Services Field Office (see **ADDRESSES** section). Requests for copies of the regulations on listed wildlife and plants and inquiries about prohibitions and permits should be directed to the U.S. Fish and Wildlife Service, Endangered Species Act Section 10 Program at the same address.

#### *Economic Analysis*

Section 4(b)(2) of the Act requires that we designate critical habitat on the basis of the best scientific and commercial information available, and that we consider the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat designation if the benefits of exclusion outweigh the benefits of designation, provided the exclusion will not result in the extinction of the species. We will conduct an analysis of the economic

impacts of designating these areas as critical habitat prior to making a final determination. When completed, we will announce the availability of the draft economic analysis with a notice in the **Federal Register**.

#### **Public Comments Solicited**

We intend that any final action resulting from this proposal be as accurate and as effective as possible. Therefore, we solicit comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We are particularly interested in comments concerning:

(1) The reasons why any proposed area should or should not be determined to be critical habitat as provided by section 4 of the Act and 50 CFR 424.12(a)(1), including whether the benefits of designation will outweigh any threats to the species due to designation;

(2) Any areas on the islands of Maui, Hawaii, Kahoolawe, Molokai, or the other main Hawaiian Islands not included in this proposed designation that may be considered essential to the species' conservation and recovery and should be included in the final designation;

(3) Specific information on the number and distribution of the Blackburn's sphinx moth and what habitat is essential to the conservation of this species and why;

(4) Whether lands within proposed critical habitat are currently being managed to address conservation needs of the Blackburn's sphinx moth;

(5) Land use practices and current or planned activities in the subject areas and their possible impacts on proposed critical habitat;

(6) Military training or similar activities of the U.S. Department of Defense (Army, Navy, and National Guard) on State-owned lands (e.g., Kanaio Training Area);

(7) Any foreseeable economic or other impacts resulting from the proposed designation of critical habitat, in particular, any impacts on small entities or families;

(8) Whether future development and approval of conservation measures (e.g., Conservation Agreements, Safe Harbor Agreements, etc.) should be excluded from critical habitat and, if so, by what mechanism; and,

(9) Economic and other values associated with designating critical habitat for the Blackburn's sphinx moth, such as those derived from non-consumptive uses (e.g., hiking, camping, eco-tourism, enhanced watershed



protection, improved air quality, increased soil retention, "existence values," and reductions in administrative costs).

If we receive information that any of the areas proposed as critical habitat are currently being managed to address the conservation needs of the Blackburn's sphinx moth and provide adequate management and protection, we would remove such areas from the final rule because they would not meet the definition of critical habitat in section 3(5)(A)(i) of the Act. If you wish to comment, you may submit your comments and materials concerning this proposal by either of the following methods:

1. You may submit written comments and information to Paul Henson, Field Supervisor, Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3-122, Box 50088, Honolulu, HI 96850.

2. You may hand-deliver written comments to our Pacific Islands Fish and Wildlife Office, 300 Ala Moana Boulevard, Room 3-122, Honolulu, Hawaii.

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Respondents may request that we withhold their home address, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold a respondent's identity, as allowable by law. If you wish us to withhold your name or address, you must state this request prominently at the beginning of your comment. To the extent consistent with applicable law, we will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the Pacific Islands Fish and Wildlife Office in Honolulu.

#### Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of such review is to ensure listing and critical habitat decisions are based on scientifically sound data, assumptions, and analyses. We will send copies of this proposed rule to these peer

reviewers immediately following publication in the **Federal Register**. We will invite the peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed designations of critical habitat. We will consider all comments and data received during the 60-day comment period on this proposed rule during preparation of a final rule-making. Accordingly, the final decision may differ from this proposal.

#### Clarity of the Rule

Executive Order 12866 requires each agency to write regulations and notices that are easy to understand. We invite your comments on how to make this proposed rule easier to understand, including answers to questions such as the following—(1) Are the requirements in the proposed rule clearly stated? (2) Does the proposed rule contain technical jargon that interferes with the clarity? (3) Does the format of the proposed rule (grouping and order of the sections, use of headings, paragraphing, etc.) aid or reduce its clarity? (4) Is the description of the notice in the "Supplementary Information" section of the preamble helpful in understanding the notice? What else could we do to make this proposed rule easier to understand?

Send a copy of any comments that concern how we could make this rule easier to understand to the Office of Regulatory Affairs, Department of the Interior, Room 7229, 1849 C Street NW., Washington, DC 20240. You also may e-mail comments to: [Exsec@ios.doi.gov](mailto:Exsec@ios.doi.gov).

#### Required Determinations

##### *Regulatory Planning and Review*

In accordance with Executive Order (E.O.) 12866, this document is a significant rule and has been reviewed by the Office of Management and Budget (OMB) in accordance with the four criteria discussed below. We are preparing a draft economic analysis of this proposed action, which will be available for public comment, to determine the economic consequences of designating the specific areas as critical habitat. The availability of the draft economic analysis will be announced in the **Federal Register** so that it is available for public review and comment.

(a) While we will prepare an economic analysis to assist us in considering whether areas would be excluded from critical habitat designation pursuant to section 4 of the Act, we do not believe this rule will have an annual effect on the economy

of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local or tribal communities. Therefore, we do not believe a cost benefit and economic analysis pursuant to E.O. 12866 is required.

Under the Act, critical habitat may not be adversely modified by a Federal agency action; critical habitat does not impose any restrictions on non-Federal persons unless they are conducting activities funded or otherwise sponsored or permitted by a Federal agency. Section 7 of the Act requires Federal agencies to ensure that they do not jeopardize the continued existence of the species. Section 7 also requires Federal agencies to consult with us if a proposed action may affect a listed species or its critical habitat. Based on our experience with the species and its needs, we believe that any Federal action or authorized action that could potentially cause an adverse modification of the proposed critical habitat would currently be considered as jeopardy to the species under the Act in areas occupied by the species.

Accordingly, we do not expect the designation of areas as critical habitat within the geographical range of the species to have any incremental impacts on what actions may or may not be conducted by Federal agencies or non-Federal persons that receive Federal authorization or funding. The designation of areas as critical habitat where section 7 consultations would not have occurred but for the critical habitat designation may have impacts on what actions may or may not be conducted by Federal agencies or non-Federal persons who receive Federal authorization or funding that are not attributable to the species listing. We will evaluate any impact through our economic analysis (required under section 4 of the Act: see the "Exclusions Under Section 4(b)(2)" section of this rule). Non-Federal persons who do not have a Federal sponsorship of their actions are not restricted by the designation of critical habitat.

(b) We do not believe this rule would create inconsistencies with other agencies' actions. As discussed above, Federal agencies have been required to ensure that their actions do not jeopardize the continued existence of the Blackburn's sphinx moth since its listing in February 2000 (65 FR 4770). We will evaluate any additional impact through our economic analysis. Because of the potential for impacts on other Federal agencies' activities, we will continue to review this proposed action

for any inconsistencies with other Federal agencies' actions.

(c) We do not believe this rule, if made final, would materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. Federal agencies are currently required to ensure that their activities do not jeopardize the continued existence of a listed species, and, as discussed above, we will evaluate any additional impacts through an economic analysis.

(d) OMB has determined that this rule raises novel legal or policy issues and, as a result, this rule has undergone OMB review.

*Regulatory Flexibility Act (5 U.S.C. 601 et seq.)*

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that rule will not have a significant economic effect on a substantial number of small entities. SBREFA also amended the RFA to require a certification statement. In today's rule, we are certifying that the rule will not have a significant effect on a substantial number of small entities for the reasons described below.

However, should the economic analyses prepared pursuant to section 4(b)(2) of the ESA indicate otherwise, we will revisit this determination at that time.

Small entities include small organizations, such as independent non-profit organizations, and small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents, as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business,

special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine if potential economic impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule as well as the types of project modifications that may result. In general, the term significant economic impact is meant to apply to a typical small business firm's business operations.

To determine if the rule would affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (e.g., housing development, grazing, oil and gas production, timber harvesting, etc.). We apply the "substantial number" test individually to each industry to determine if certification is appropriate. In some circumstances, especially with proposed critical habitat designations of very limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the numbers of small entities potentially affected, we also consider whether their activities have any Federal involvement; some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation.

Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies; non-Federal activities are not affected by the designation. In areas where the species is present, Federal agencies are already required to consult with us under section 7 of the Act on activities that they fund, permit, or implement that may affect the Blackburn's sphinx moth. If this critical habitat designation is finalized, Federal agencies must also consult with us if their activities may affect designated critical habitat. However, we do not believe this will result in any additional regulatory burden on Federal agencies or their applicants because consultation would already be required due to the presence of the listed species, and the duty to avoid adverse modification of critical habitat would not trigger additional regulatory impacts beyond the duty to avoid jeopardizing the species.

Even if the duty to avoid adverse modification does not trigger additional regulatory impacts in areas where the species is present, designation of critical habitat could result in an additional economic burden on small entities due to the requirement to reinstate consultation for ongoing Federal

activities. However, Blackburn's sphinx moth has only been listed since February 2000, and there have been only five informal consultations involving the species. Therefore, the requirement to reinstate consultations for ongoing projects is not anticipated to affect a substantial number of small entities.

When the species is clearly not present, designation of critical habitat could trigger additional review of Federal activities under section 7 of the Act. Blackburn's sphinx moth has been listed only a relatively short time and there have been no activities with Federal involvement in these areas during this time. There is a history of only five informal consultations based on the listing of this species to date. Therefore, for the purposes of this review and certification under the Regulatory Flexibility Act, we are assuming that any future consultations in the areas proposed as critical habitat will be due to the critical habitat designation.

One of the proposed designation is partially on Federal lands. All of the eight units are partially or entirely on lands owned and managed by the State of Hawaii, which is not a small entity for purposes of this analysis. This includes units within the Ahihi-Kinau NAR, Kanaio NAR, Kanaha State Bird Sanctuary, or the Kahoolawe Island Reserve. All of these land areas are primarily managed for conservation of natural resources, including threatened and endangered species. On State lands, activities with no Federal involvement would not be affected by the critical habitat designation.

Six of the eight units of the proposed designation are partially on privately-owned land. On private lands, activities that lack Federal involvement would not be affected by the critical habitat designation. Other than some agriculture and ranching, no activities of an economic nature currently occur on the private lands in the area encompassed by this proposed designation. Furthermore, many of these areas are within a State Conservation District and have a very limited range of allowable activities that could occur there under the State Conservation District Use permitting program. Because of the Conservation District zoning, and because many of the sites are so remote and inaccessible that off-road vehicular transport or hiking is normally required for access, new commercial or additional agricultural development is unlikely even at a small scale. Therefore, Federal agencies such as the Economic Development Administration, which is occasionally

involved in funding municipal projects, are unlikely to be involved in projects in these areas. Informal consultation under section 7 of the Act between us and another Federal agency has occurred a total of five times, specifically on the island of Kahoolawe and entirely involved the Department of the Navy.

In general, two different mechanisms in section 7 consultations could lead to additional regulatory requirements. First, if we conclude in a biological opinion, that a proposed action is likely to jeopardize the continued existence of a species or adversely modify its critical habitat, we can offer "reasonable and prudent alternatives." Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid jeopardizing the continued existence of listed species or resulting in adverse modification of critical habitat. A Federal agency and an applicant may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found jeopardy or adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were obtained, the Federal agency would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives. Secondly, if we find that a proposed action is not likely to jeopardize the continued existence of a listed animal species, we may identify reasonable and prudent measures designed to minimize the amount or extent of take and require the Federal agency or applicant to implement such measures through non-discretionary terms and conditions. However, the Act does not prohibit the take of listed plant species or require terms and conditions to minimize adverse effect to critical habitat. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

Based on our experience with section 7 consultations for all listed species, virtually all projects—including those that, in their initial proposed form, would result in jeopardy or adverse

modification determinations in section 7 consultations—can be implemented successfully with, at most, the adoption of reasonable and prudent alternatives. These measures, by definition, must be economically feasible and within the scope of authority of the Federal agency involved in the consultation. As we have only a minimal consultation history for Blackburn's sphinx moth, we can only describe the general kinds of actions that may be identified in future reasonable and prudent alternatives. These are based on our understanding of the needs of the species and the threats it faces, especially as described in the final listing rule and in this proposed critical habitat designation, as well as our experience with native Hawaiian arthropods in Hawaii. The kinds of actions that may be included in future reasonable and prudent alternatives include conservation set-asides, management of competing non-native species and predators, restoration of degraded habitat, construction of protective fencing, and regular monitoring. These measures are not likely to result in a significant economic impact to project proponents. As required under section 4(b)(2) of the Act, we will conduct an analysis of the potential economic impacts of this proposed critical habitat designation, and will make that analysis available for public review and comment before finalizing this designation.

In summary, we have considered whether this proposed rule would result in a significant economic effect on a substantial number of small entities. It would not affect a substantial number of small entities. The entire designation involves eight sites partially or entirely on State lands, one site partially on Federal land, and six sites partially on privately owned lands, all of which are located in areas where likely future land uses are not expected to result in Federal involvement or section 7 consultations. As discussed earlier, many of the private lands are within a State Agricultural District where few commercial activities are undertaken, or within a State Conservation District where no commercial activities are undertaken at those locations and, therefore, are not likely to require any Federal authorization. In these areas, Federal involvement—and thus section 7 consultations, the only trigger for economic impact under this rule—would be limited to a small subset of the area proposed. The most likely Federal involvement would be through a habitat restoration or conservation activity for this species or another federally listed endangered or threatened species.

Because of the rugged terrain and extreme remoteness of most of the proposed designation areas, we anticipate that projects involving Federal agencies will be infrequent. This rule would result in project modifications only when proposed Federal activities would destroy or adversely modify critical habitat. While this may occur, it is not expected frequently enough to affect a substantial number of small entities. Even when it does occur, we do not expect it to result in a significant economic impact, as the measures included in reasonable and prudent alternatives must be economically feasible and consistent with the proposed action. We are certifying that the proposed designation of critical habitat for Blackburn's sphinx moth will not have a significant economic impact on a substantial number of small entities, and an initial regulatory flexibility analysis is not required. However, should the economic analyses of this proposed rule indicate that there may be significant economic impacts on a substantial number of small entities, we will revisit this determination.

#### *Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)*

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 August 25, 2000 *et seq.*):

(a) We believe this rule will not "significantly or uniquely" affect small governments. A Small Government Agency Plan is not required. Small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect the critical habitat. However, as discussed above, these actions are currently subject to equivalent restrictions through the listing protections of the species, and no further restrictions are anticipated to result from critical habitat designation of occupied areas. In our economic analysis, we will evaluate any impact of designating areas where section 7 consultations would not have occurred but for the critical habitat designation.

(b) This rule will not produce a Federal mandate of \$100 million or greater in any year; that is, it is not a "significant regulatory action" under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments.

#### *Takings*

In accordance with Executive Order 12630 ("Government Actions and Interference with Constitutionally



Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
* Moth, Blackburn's sphinx.	* <i>Manduca blackburni</i> .	* U.S.A. (HI) .....	* NA .....	* E	* 682	* 17.95(i) .....	* NA
*	*	*	*	*	*	*	*

3. Amend § 17.95(i) by adding critical habitat for the Blackburn's sphinx moth (*Manduca blackburni*) in the same alphabetical order as this species occurs in § 17.11(h), to read as follows:

**§ 17.95 Critical habitat—fish and wildlife.**

\* \* \* \* \*

(i) Insects.

\* \* \* \* \*

Blackburn's Sphinx Moth (*Manduca blackburni*)

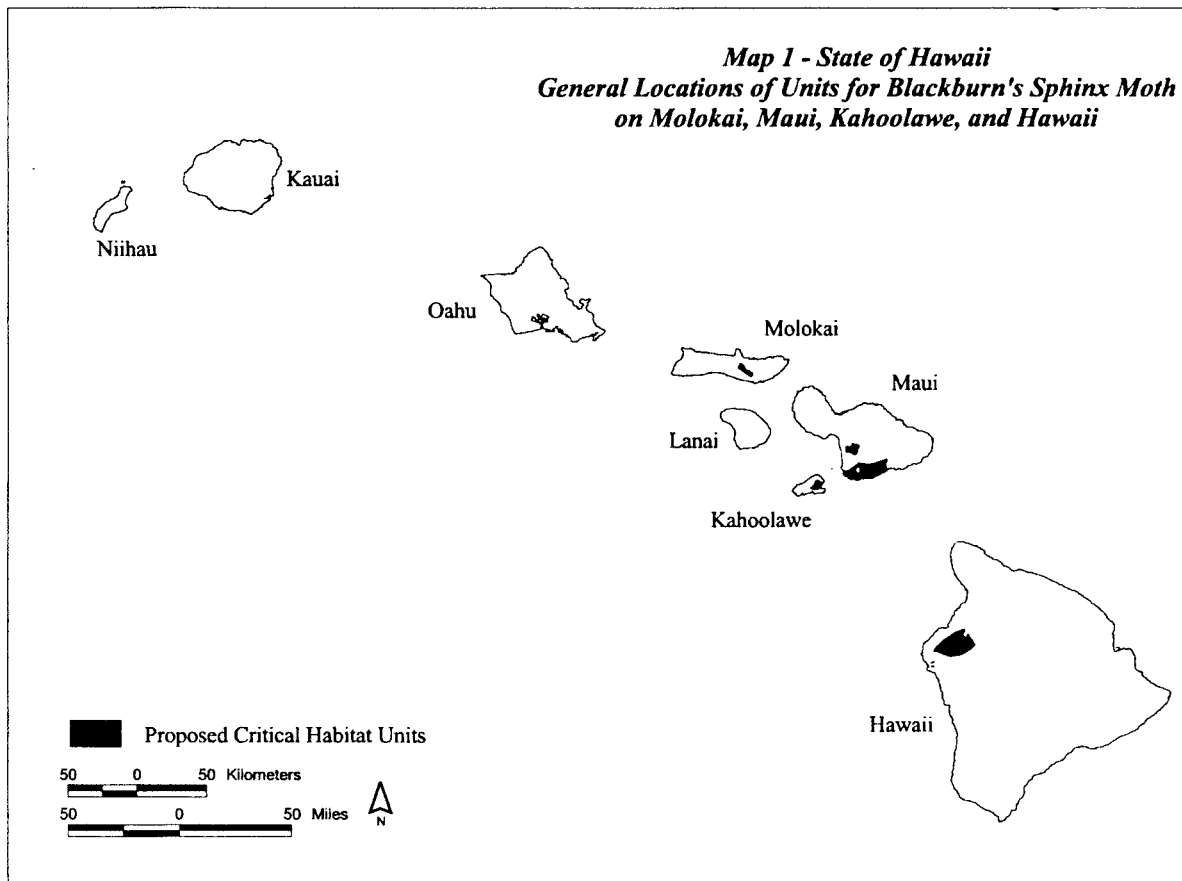
(1) Critical habitat units are depicted for the islands of Maui, Kahoolawe, Hawaii, and Molokai on the maps below.

(2) Found within these areas are the primary constituent elements of critical habitat for Blackburn's sphinx moth that includes specific habitat components

identified as essential for the primary biological needs of foraging, sheltering, maturation, dispersal, breeding, and egg laying. The primary constituent elements required by Blackburn's sphinx moth larvae for foraging and maturation are the two identified larval host plant species within the endemic *Nothoecstrum* genus (*Nothoecstrum breviflorum* and *Nothoecstrum latifolium*) and the dry and mesic habitats between the elevations of sea level and 1,525 m (5,000 ft) and receiving between 25 and 250 cm (10 and 100 in) of annual precipitation that currently support or historically have supported these plants. The primary constituent elements required by Blackburn's sphinx moth adults for foraging, sheltering, dispersal, breeding, and egg production are native, nectar-

supplying plants, including but not limited to *Ipomoea* spp., *Capparis sandwichiana*, and *Plumbago zeylanica* and the dry and mesic habitats between the elevations of sea level and 1,525 m (5,000 ft) and receiving between 25 and 250 cm (10 and 100 in) of annual precipitation that currently support or historically have supported these plants.

(3) Critical habitat does not include existing man-made features and structures within the boundaries of the mapped units, such as houses, offices, warehouses, stores, or any other buildings, roads, aqueducts, antennas, towers, water tanks, agricultural fields, paved areas, residential lawns, gardens, parking lots, cemeteries, and any other urban landscaped areas or man-made structures.



(4) Critical Habitat Unit 1: Island of Maui, Ahihi-Kinau NAR—Ulupalakua—Auwahi—Kanaio Meta Unit (15,217 ha; 37,603 ac).

(i) Unit consists of eighteen boundary points with the following coordinates in UTM Zone 4 with the units in meters using North American Datum of 1983 (NAD83): coastline. 766711, 2282647; 766747, 2282662; 767710, 2282266; 769673, 2283077; 771466, 2284436; 774373, 2286248; 774750, 2286890; 775222, 2286928; 775776, 2286374; 776595, 2286552; 777581, 2286456; 779622, 2286089; 782827, 2286695;

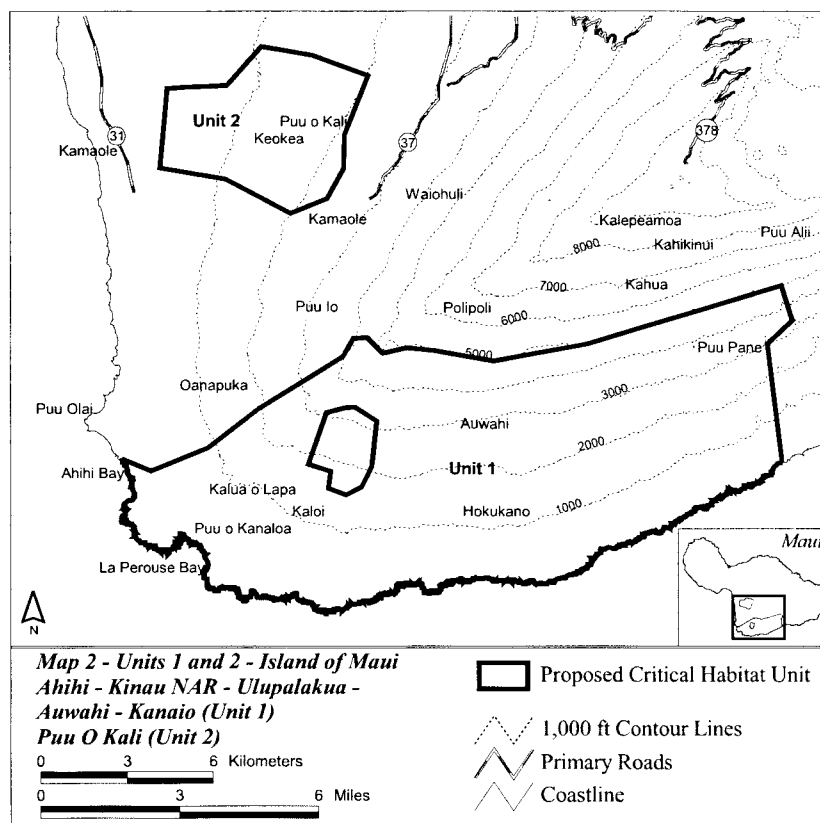
789629, 2288724; 790001, 2287513; 789133, 2286682; 789642, 2282642; 789689, 2282548. coastline.

(ii) Excluding one area (502 ha; 1,241 ac) with eleven boundary points with the following coordinates in UTM Zone 4 with the units in meters using North American Datum of 1983 (NAD83): 774448, 2284474; 774807, 2284493; 775562, 2284002; 775392, 2282436; 775203, 2282020; 775033, 2281700; 774505, 2281416; 773882, 2281643; 773957, 2282247; 773165, 2282492; 773806, 2284304.

(5) *Critical Habitat Unit 2*: Island of Maui, Puu O Kali Unit (2,750 ha; 6,794 ac)

(i) Unit consists of twelve boundary points with the following coordinates in UTM Zone 4 with the units in meters using North American Datum of 1983 (NAD83): 768031, 2292836; 768276, 2295610; 768897, 2295644; 770362, 2295705; 771540, 2297064; 773291, 2296777; 775265, 2296040; 774448, 2294006; 774392, 2292779; 773825, 2291760; 772557, 2291243; 770315, 2292439.

(ii) Units 1 and 2 map follows:



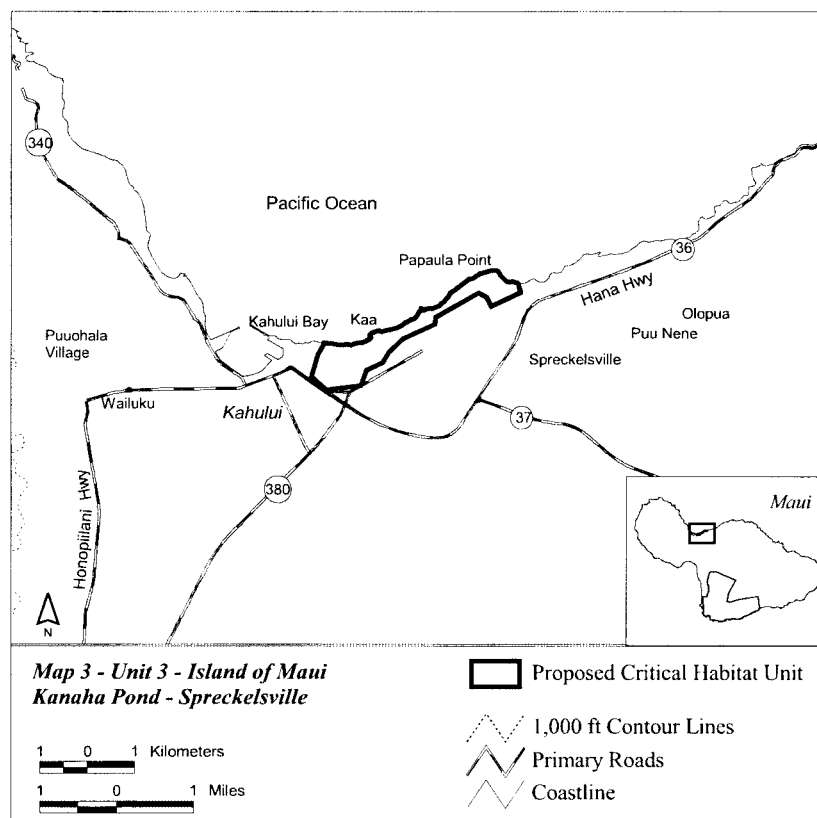
(6) *Critical Habitat Unit 3*: Island of Maui, Kanaha Pond—Spreckelsville Unit (226 ha; 559 ac).

(i) Unit consists of 32 boundary points connecting to the coastline with the following coordinates in UTM Zone 4 with the units in meters using North American Datum of 1983 (NAD83): coastline; 768327, 2314328; 768382,

2314137; 767760, 2313845; 767663, 2314040; 767504, 2314125; 766602, 2313625; 766566, 2313467; 765920, 2313174; 765615, 2312894; 765481, 2312662; 765152, 2312516; 765017, 2312187; 764298, 2312089; 763994, 2312370; 764115, 2312821; 764262, 2313077; 768327, 2314328; 768382, 2314137; 767760, 2313845; 767663,

2314040; 767504, 2314125; 766602, 2313625; 766566, 2313467; 765920, 2313174; 765615, 2312894; 765481, 2312662; 765152, 2312516; 765017, 2312187; 764298, 2312089; 763994, 2312370; 764115, 2312821; 764262, 2313077; coastline.

(ii) Unit 3 map follows:



(7) *Critical Habitat Unit 4: Island of Kahoolawe, Upper Kahoolawe Unit* (1,878 ha; 4,641 ac).

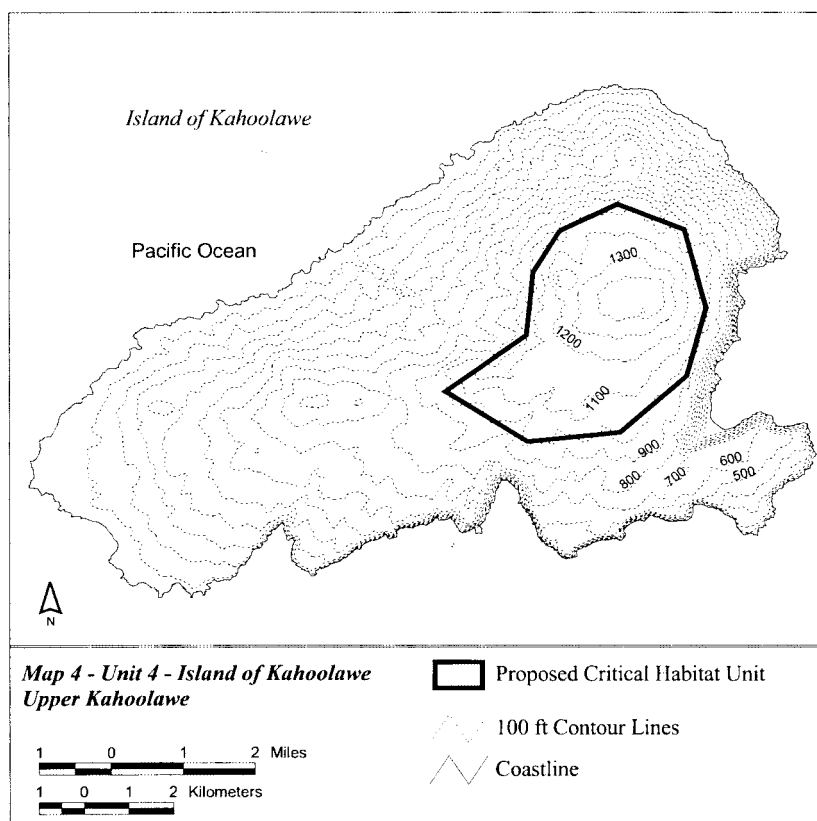
(i) Unit consists of 11 boundary points with the following coordinates in UTM

Zone 4 with the units in meters using North American Datum of 1983 (NAD83): 751626, 2276907; 752925, 2277513; 754425, 2276936; 754916, 2275176; 754483, 2273646; 752982,

2272377; 750905, 2272175; 749058, 2273300; 750876, 2274570; 751020, 2275984; 751626, 2276907.

(ii) Unit 4 map follows:





(8) *Critical Habitat Unit 5-A*: Island of Hawaii, Kailua-Kona Unit 5-A (125 ha; 309 ac).

(i) Unit consists of twelve boundary points with the following coordinates in UTM Zone 5 with the units in meters using North American Datum of 1983 (NAD83): 183939, 2179538; 184520, 2179963; 185151, 2180448; 185315, 2180573; 185691, 2180671; 185857, 2180468; 185894, 2179969; 185820, 2179858; 185434, 2179678; 185248, 2179574; 184128, 2179413; 183981, 2179367.

(9) *Critical Habitat Unit 5-B*: Island of Hawaii, Kailua-Kona Unit 5-B (105 ha; 258 ac).

(i) Unit consists of eleven boundary points with the following coordinates in UTM Zone 5 with the units in meters

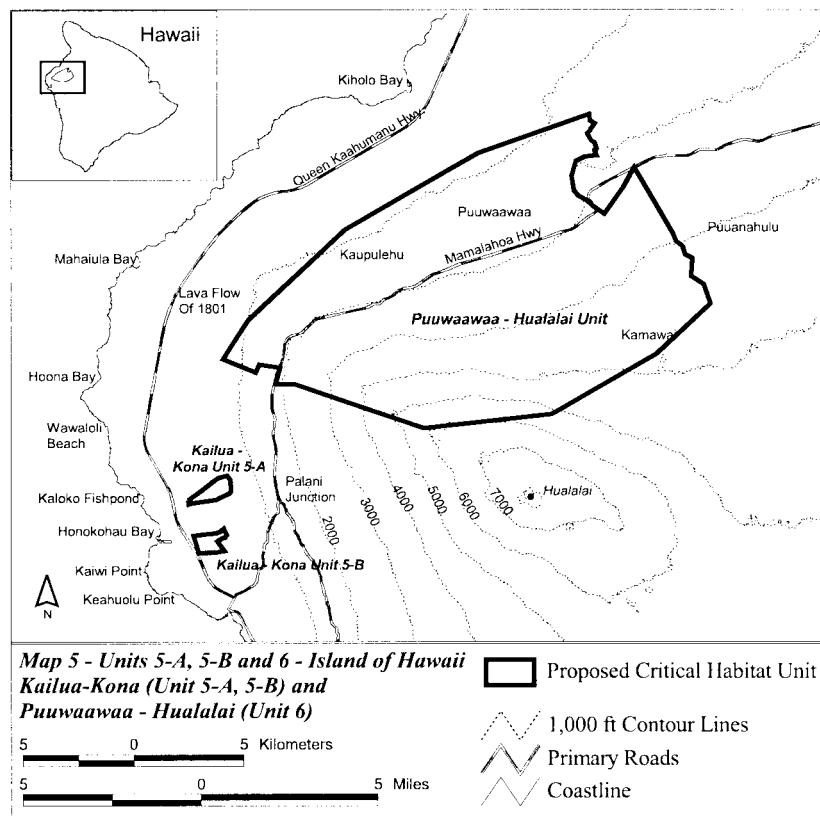
using North American Datum of 1983 (NAD83): 185735, 2177873; 185487, 2177806; 185264, 2177683; 185592, 2177229; 185290, 2177181; 184428, 2177141; 184179, 2177926; 184567, 2177983; 185170, 2178035; 185410, 2178129; 185570, 2178249.

(10) *Critical Habitat Unit 6*: Island of Hawaii, Puuwaawaa-Hualalai Unit (18,111 ha; 44753 ac).

(i) Unit consists of forty-two boundary points with the following coordinates in UTM Zone 5 with the units in meters using North American Datum of 1983 (NAD83): 197118, 2195356; 202108, 2197143; 202133, 2196862; 202349, 2196713; 202177, 2196459; 202117, 2196355; 202013, 2196242; 202195, 2195935; 202342, 2195847; 202416,

2195563; 202342, 2195466; 202422, 2195266; 201923, 2195212; 201490, 2194988; 201289, 2194293; 201423, 2193644; 201610, 2193412; 201976, 2193196; 202259, 2192949; 202797, 2192583; 203648, 2193808; 204126, 2194708; 205894, 2191689; 206044, 2191339; 206344, 2191105; 206443, 2190759; 206778, 2190572; 206728, 2189754; 207295, 2189387; 207595, 2188520; 205155, 2186232; 200424, 2183478; 194641, 2182859; 188871, 2184829; 187928, 2184862; 188121, 2185610; 187173, 2185749; 187029, 2185392; 185530, 2185978; 185844, 2186480; 186693, 2187771; 191074, 2191859.

(ii) Unit 5-A, Unit 5-B, and Unit 6 map follows:



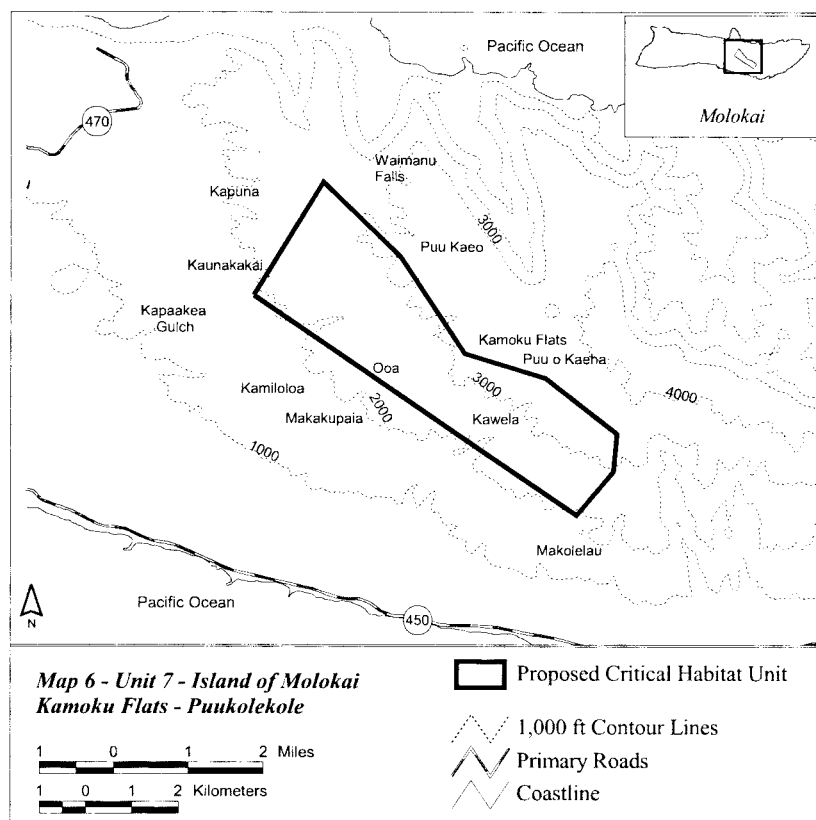
(11) *Critical Habitat Unit 7*: Island of Molokai, Kamoko Flats—Puukolekole Unit (1,829 ha; 4,520 ac).

(i) Unit consists of nine boundary points with the following coordinates in

UTM Zone 4 with the units in meters using North American Datum of 1983 (NAD83): 710484, 2337505; 711990, 2339952; 713666, 2338327; 715057,

2336242; 716822, 2335699; 718354, 2334492; 718279, 2333663; 717488, 2332722; 710484, 2337505.

(ii) Unit 7 map follows:



\* \* \* \* \*

Dated: May 17, 2002.

**Craig Manson,**

*Assistant Secretary for Fish and Wildlife and Parks.*

[FR Doc. 02-14683 Filed 6-12-02; 8:45 am]

BILLING CODE 4310-55-P

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

#### **Endangered and Threatened Wildlife and Plants; Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petitions; Annual Description of Progress on Listing Actions**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of review.

**SUMMARY:** In this candidate notice of review (CNOR), we, the U.S. Fish and Wildlife Service (Service), present an updated list of plant and animal species native to the United States that we regard as candidates or have proposed for addition to the Lists of Endangered and Threatened Wildlife and Plants under the Endangered Species Act of

1973, as amended. Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings, allowing resource managers to alleviate threats and thereby possibly remove the need to list species as endangered or threatened. Even if we subsequently list a candidate species, the early notice provided here could result in fewer restrictions on activities by prompting candidate conservation measures to alleviate threats to the species.

We request additional status information that may be available for the identified candidate species and information on species that we should include as candidates in future updates of this list. We will consider this information in preparing listing documents and future revisions to the notice of review. This information will help us in monitoring changes in the status of candidate species and in conserving candidate species.

We announce the availability of Candidate and Listing Priority Assignment Forms (candidate forms) for each candidate species. These documents describe the status and threats that we evaluated in order to assign a listing priority number to each species. We also announce our findings on recycled petitions and describe our progress in revising the Lists of

Endangered and Threatened Wildlife and Plants during the period October 30, 2001 to May 30, 2002.

**DATES:** We will accept comments on the candidate notice of review at any time.

**ADDRESSES:** Submit your comments regarding a particular species to the Regional Director of the Region identified in **SUPPLEMENTARY INFORMATION** as having the lead responsibility for that species. You may submit comments of a more general nature to the Chief, Division of Conservation and Classification, U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Room 420, Arlington, VA 22203 (703/358-2171). Written comments and materials received in response to this notice will be available for public inspection by appointment at the Division of Conservation and Classification (for comments of a general nature only) or at the appropriate Regional Office listed in **SUPPLEMENTARY INFORMATION**.

Information regarding the range, status, and habitat needs of and listing priority assignment for a particular species is available for review at the appropriate Regional Office listed below in **SUPPLEMENTARY INFORMATION**, at the Division of Conservation and Classification, Arlington, Virginia (see address above), or on our internet